

## UROLOGY

### The Management of Urinary Infections

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During the past fifteen years the treatment of urinary infections has been completely revolutionized by the introduction of new drugs and the adoption of more modern and practical methods of investigation. The term "urinary infections" is loosely applied and may refer to any part of the urinary tract from the renal and perirenal tissues to the urethral meatus. Since treatment is influenced by the nature of the causative organism, a complete bacteriological survey of the urinary tract should be carried out, as a preliminary measure.

The following is a classification of urinary infections in which the common offending bacteria are noted. Tuberculosis, tropical infections and the more rare bacteria are omitted.

#### Bacteriology of Urinary Infections

##### Perirenal and Cortical Infections

1. Staphylococcus and streptococcus by way of blood stream.
2. Other organisms usually gram negative bacilli in cases of advanced pyonephrosis by direct infiltration.

##### The Collecting System of the Kidney, the Ureter and the Bladder

##### Bacillary Infections

- Esch. Coli (B. Coli Communis).
- B. Proteus Vulgaris.
- B. Proteus Morgagni.
- B. Proteus Ammoniae.
- Aerobacter Aerogenes.
- Salmonellae—
  1. Shigella—Include the Dysenteries.
  2. Salmonella—(Paratyphoid A. Paratyphoid B.)
  3. Ervethella—(Typhoid).
- Pseudomonas Aeruginosa (Pyocyanus).
- Pseudomonas Ureae.
- Hemophilus Influenza.
- Friedlander's Bacillus (B. Mucosus Capsulatus) (or Klebsiella Pneumoniae).

Anaerobes are rare invaders.

##### Coccal Infections

- Strep. Pyogenes (Hemolyticus).
- Strep. Viridans.
- Enterococci—a. Strep. Fecalis.
- b. Strep. Liquefaciens.
- Micrococcus Flavus.
- Micrococcus Ureae.

- Pneumococcus (Diplococcus Pneumoniae).
- Staphylococcus Aureus (Hemolyticus).
- Staphylococcus Albus.
- Amicrobic Pyuria.

##### Prostate and Seminal Vesicles

##### Gram Positive Cocci

- Staph. Aureus.
- Staph. Albus.
- Strep. Pyogenes.
- Strep. Viridans.
- Pneumococcus.
- Micrococci.

##### Gram Negative Cocci

- Neisseria Gonorrhoeae.
- Neisseria Catarrhalis.

##### Gram Negative Bacilli

- Esch. Coli.
- Friedlander's Bacillus—Rare.
- Typhosus—Rare.

##### Gram Positive Bacilli

- Diphtheroids.

##### Trichomonas.

##### Urethra—Normal Urethral Flora consists of—

- Staph. Albus.
- Diphtheroids.
- Short Gram. Neg. Diplobacilli.
- Myco-Bacterium Smegmatis from Preputial Secretions.

##### Pathogenic Organisms.

- N. Gonococcus.

Organisms found in non specific Urethritis are

- Gram Negative Bacilli.
- Gram Negative Diplobacilli.
- Gram Positive Diplococci.
- Gram Negative Diplococci { N. Flava.
- { N. Sicca.

Spirochaetes (Treponema Group).

Trichomonas.

##### Urea Splitting Organisms

- B. Proteus { Vulgaris.
- { Morgani—Strongly Ureolytic.
- { Ammoniae.
- Pseudomonas { Aeruginosa
- { Ureae.

Most strains are Ureolytic.

Staphylococcus—Many strains are Ureolytic.

Micrococcus Flavus.

Micrococcus Ureae.

In the management of urinary infection, a detailed study of the urinary tract will permit intelligent treatment of associated conditions and predisposing factors, and ensure the maximum benefit from applied treatment. Obstructive uropathy must be corrected, a calculus removed, strictures dilated, an abscess drained or any other exciting factor overcome. It is important to determine the adequacy of renal function before instituting treatment, since the efficiency of urinary antiseptics is to a great extent dependent

upon their elimination by the kidneys and the degree of concentration in the urine. Retention of these drugs in the blood stream and tissues may give rise to toxic reactions. The concentration test is probably the simplest and most useful method of determining renal function. A specific gravity of 1026 or more following eighteen hours of dehydration is considered satisfactory. Excretory urograms give a wealth of information, and should be done in cases that fail to respond to treatment, or in chronic recurrent infections.

A common source of error in determining the bacterial flora is the improper collection of a specimen of urine. In the female, a catheterized specimen is essential. In the male, the external meatus should be thoroughly cleansed and specimens collected in two glasses. Infections of the urethra and prostate produce discharges obtained in the first part of a voided specimen.

### Water Balance and Acid Base Equilibrium

A healthy person is neither an acid-base nor a water-balance problem. The buffers of the blood act as chemical shock absorbers, and prevent the accumulation of an excess of H. ions or O.H. ions which would materially change the P.H. Fluid intake is derived from two sources, the water drunk and the fluids included in the solid food. The chief factors in the maintenance of water balance are the kidneys which are responsive to even slight alterations in the amount of fluids in the body. In estimating the amount of fluids required, it must be recalled that 1000 to 1500cc's of water are vaporized daily by a normal individual, and more by a febrile one. It is well to calculate water needs on the basis of excreting a minimum of 1500 cc's urine daily; and if sepsis and fever exist, an even higher figure for urinary output is desired. A fluid intake of 3000 cc's per 24 hours is therefore desirable in a sick patient. It is desirable to produce a sufficient amount of urine to flush the urinary passages adequately, and get rid of the exudates found within them. In the majority of cases oral administration is satisfactory. The intravenous use of fluids is reserved for those cases where there is inability to take a sufficient amount by mouth, where dehydration is severe, and where there is an error in the acid-base balance. Since most ill urological patients suffer slight to marked daily losses of electrolytes, it is recommended that 500 to 1000 cc's of the daily fluid intake should be in the form of 5% dextrose in normal saline solution. A further intravenous administration, if necessary, should be 5% dextrose in water. When urinary antiseptics are administered, the fluid intake should be sufficient to obviate the danger of toxic symptoms. When acidosis becomes a factor, 1/6 molar lactate solution is used intravenously; while in alkalosis,

saline solution will usually suffice. In severe alkalosis 2% ammonium chloride may be given intravenously.

### Diet

Diet plays an important role in the treatment of urinary infections. One of the cardinal rules is to avoid foods considered to be renal irritants. These are:

1. All alcoholic beverages.
2. Condiments as catsup, horse radish, mustard, pepper, salt, spices, vinegar, ginger, etc.
3. Highly seasoned and pickled foods.
4. Such vegetables as cucumber, pickle, radish, rhubarb.

Vegetables with strong aroma: asparagus, onions, beets, cabbage, cauliflower, etc.

5. Carbonated drinks.

Changing the reaction of the urine is commonly resorted to in the treatment of urinary infections. Other methods too are used for this purpose; the diet may be a valuable adjunct.

#### 1. Alkaline Ash Diet

All vegetables and fruits other than cranberries and prune are emphasized. The following have been found efficient in reducing acidity: apple, banana, orange, muskmelon, potato. Meat and fish should be used sparingly. Proteins that may be used in small amounts are beef, ham, halibut, veal, lamb, trout, salmon. If it is necessary to intensify alkalinity, bread and meat may be omitted; and larger quantities of milk, butter, sugar and cream may be used to meet the protein and calorie requirements.

#### 2. Acid Ash Diet

Protein foods should be emphasized in an acid diet, e.g., egg, chicken, beef, veal, oyster, haddock. Vegetables and fruits are used sparingly. Vegetables that may be used in small amounts are asparagus, green peas, pumpkin, squash, turnip, mushroom, cauliflower, tomato. Fruits are: watermelon, grape, cranberry, grape-juice, cherry-juice, raspberry-juice and peach. If a greater acid residue is desired, omit milk, fruit, and vegetables for a few days, and adjust the calories by adding more acid ash foods.

It must be emphasized that taste is no indication of type of diet. For example: eggs and meat form acid, while orange, grapefruit and tomato form alkali.

#### 3. Ketogenic Diet

It has long been known that under conditions of starvation or the use of a diet low in carbohydrate and high in fat, or in diabetes mellitus where carbohydrate metabolism is perverted, ketone acids are produced in the body. Under these conditions, urinary infections were rarely known to

It was not until 1932 that Helmholtz made the observation that a glass of urine from an epileptic child receiving a Ketogenic diet remained sterile after standing in a warm room for several days. He then applied this principle to the treatment of infection.

The Ketogenic diet, while in itself a urinary acidifier, has an effect more potent than can be attributed alone to acidification. The explanation is that one of the Ketone bodies, beta hydroxy butyric acid is set free, and has a bactericidal effect in an acid urine. The administration of H.B. acid alone is useless because it is oxidized and loses its effect.

Following this discovery, the standard procedure for treatment of bacillary and strep. fecalis infections consisted in the administration of a Ketogenic diet plus urinary acidification.

The Ketogenic diet can be planned so that the patient may develop an intense Ketosis within a few days. Typical foods allowed in a Ketogenic diet are:

Fats—butter, bacon, fat, salad oils, etc. Cream, meat, bacon, egg. Vegetables (a) 3% in large amounts, (b) 6% in limited amounts. Fruits, 5 and 10% in limited amounts.

#### Typical Foods to Avoid

Cereals and bread stuffs, milk, 15% to 20% vegetables, 15% to 20% fruits. Sweets, sugar, jelly, jam, honey, candy, pastry, pie, cake, ice cream.

The high fat content of this diet renders it extremely unpopular with patients, and it is therefore impractical as an effective therapeutic measure.

### Drugs

#### 1. Acidifiers and Alkalinizers

Efforts to change the reaction of urine from alkaline to acid and vice versa have been made with the hope that in the changed medium, the growth of the organism will be inhibited. This refers particularly to *B. Coli* infection. The optimum growth of bacilli takes place at a P.H. of 6 to 7. This is the average reaction of urine in a person on a mixed diet. It is known that the growth of colon bacillus is inhibited at a P.H. of 5 or less on the acid side and 9.2 or more on the alkaline side. Acidification or alkalinization sufficient to kill all organisms would be injurious to the kidneys. The common alkalinizers are sodium bicarbonate and potassium citrate. The common acidifiers are ammonium chloride, sodium acid phosphate, dilute HCL and glutamic acid.

In the presence of a urea-splitting infection, ammonium chloride as an acidifier is useless and dangerous. Ammonium compounds are nitrogenous, resulting in increased excretion of urea in the urine. This provides a richer pasturage

for urea-splitting organisms; and more ammonia is formed. As a result, the urine can never become acid. The same is applicable to sodium acid phosphate. In this type of infection, dilute HCL or glutamic acid are the acidifiers of choice.

#### 2. Urotropin (Hexamethylenamine or Methenamine)

This is one of the oldest of urinary antiseptics, and exerts its optimum effect in an acid medium. It acts by the liberation of formaldehyde which will destroy many of the bacillary invaders of the urinary tract. This drug is usually given by mouth in combination with one of the acidifiers; or it may be administered intravenously. Urotropin has been superseded by other more effective chemotherapeutic agents. However, it should not be forgotten when infection fails to respond to other measures. Administration of this drug over a long period of time may give rise to bladder irritation and hematuria.

#### 3. Pyridium

Pyridium is a very useful therapeutic agent, although its mode of action is not completely known. It possesses analgesic and anaesthetic properties, and may be used in those cases of infection where dysuria, frequency, and backache are prominent symptoms. It is said to have some slight action in inhibiting the growth of staphylococci and hemolytic streptococci.

Methylene blue is also useful for its analgesic properties in urinary infection.

#### 4. Mandelic Acid

Mandelic acid was discovered by Rosenheim in 1935, while investigating the higher groups of keto acids. This is an hydroxy acid, which, taken by mouth, is not changed by metabolism in the body, but is excreted as such in the urine. Its germicidal activity is directed particularly to uncomplicated *E. Coli* infections and to the streptococcus fecalis. The latter organism is not consistently affected by any of the sulfonamides; mandelic acid is thus considered specific. The maximum efficiency of mandelic acid is obtained when the P.H. of the urine is 5.3 or less. Acidifying agents such as ammonium chloride or dilute HCL should be used in conjunction with this drug. Mandelic acid is given in the form of Ammonium or Calcium Mandelate sufficient to yield 12 grams daily. This may be given as an elixir, syrup or tablet. The urinary P.H. is taken daily, and the amount of acidifier required estimated accordingly. It is well to begin with ammonium chloride—60 grains daily, then reduce or increase as indicated by the urinary P.H. Care should be taken to avoid any items on the diet that may alkalinize the urine—such as milk of magnesia, soda bicarb., and fruit juices, chiefly



from oranges, lemons and grapefruit. An acid ash diet would be ideal. Fluids should be restricted in order to concentrate the drug in the urine. Mandelic acid may be employed for 14 to 21 days. A longer period of administration may be injurious to the kidneys. In view of the necessity for fluid restriction, it is not a safe drug to use during the acute febrile phase of a urinary infection. It also must be used with caution in cases of renal impairment. The appearance of albumen, red blood cells and casts in the urine is an indication to stop the drug.

Following the introduction of Mandelic acid, the Ketogenic diet ceased to be used.

### 5. Neocarsphenamine

Neocarsphenamine is a useful urinary antiseptic in coccal infections that have resisted other forms of therapy. Acidification of the urine improves the results. Neocarsphenamine is also a valuable therapeutic agent in primary amicrobic pyuria. The pathogenesis of this condition is not clear. It usually sets in acutely with local urinary disturbances but without fever or constitutional symptoms. The urine is purulent and generally contains red cells which may be in sufficient amount to cause a terminal hematuria. Results of animal inoculation make it probable that this type of pyuria is due to a gram-positive coccus which is extremely difficult to grow. Small doses of neocarsphenamine are practically as efficacious as large ones, and followed by fewer reactions. Improvement usually occurs after the first injection. Altogether three to five injections are given, 4 days apart. The dose in the average male adult is .3 grams initially followed by .45 grams for the remaining injections.

### 6. The Sulfonamides

Exclusive of penicillin and streptomycin, the sulfonamide group constitutes the most potent weapon ever possessed in the treatment of urinary infection. Sulfanilamide was synthesized in 1908 by Gelmo but it was not until 1935 that its anti-infective action was discovered by Domagk. Micro-organisms are not killed by the drug unless very high concentrations are used; but a bacteriostatic effect is noted. A host effect is produced so that the bacteriostatic action enables the normal defenses of immunity to destroy pathogens by phagocytosis and lysis. The condition of "fastness" exists when the hitherto susceptible organism no longer exhibits results of bacteriostatic action. There is a suggestion that fastness is acquired in some cases during administration of the drug.

The sulfonamides disappear from the blood into the urine in about 8 hours; and the maximum excretion occurs in six to seven hours. It is prob-

able that these drugs act both within the and in the urine itself.

### Acetylation

The sulfonamides are excreted partly in free state and partly as the therapeutically active acetylated derivative. Acetylation takes place in the liver, and presents considerable variation in different patients. The acetyl derivative is less soluble than the free drug and is therefore more prone to crystallization. Sulfanilamide is highly soluble and its acetylated derivative is relatively soluble so that crystallization in vivo does not occur. The other sulfonamides noted above are less soluble and crystallization of the acetyl derivative may give rise to renal complications. These drugs and their acetyl derivatives are weak acids. As in the case of other weak acids, sodium salts are quite soluble. Salt formation, hence solubility, is greatly increased at a range of P.H. Alkalinization of the urine forms the sodium salt is therefore a prophylactic measure against crystallization.

### Other Toxic Effects

In most instances untoward effects are of little moment; but serious reactions may be countered.

1. **Effects on central nervous system.** Dizziness, tinnitus, headache, malaise, confusion, etc. Peripheral neuritis is a rare complication.
2. **Fever**—"Drug fever" may alter the clinical picture in a confusing manner.
3. **Dermatitis**—The rash may be purpuric, licheniform or urticarial; and this may be associated with conjunctival injection resembling "pink eye".
4. **Cyanosis**—Is most frequent with sulfanilamide, and is due to methemoglobinemia.
5. **Anaemias** — (a) Hyperchromic Macrocytic anaemia. (b) Acute hemolytic anaemia. (c) Granulocytopenia.
6. **Toxic Hepatitis**—Is usually of a mild type.
7. **Anuria**—An acute allergic reaction may produce complete anuria without crystal formation.

### Choice of Sulfonamide

In the treatment of urinary infections the need only be concerned with sulfanilamide, sulfathiazole, sulfadiazine, sulfamerazine, sulfapyridine, and sulfasuxidine.

Sulfanilamide is especially effective against the streptococcus pyogenes. It is said to have little value in proteus infections; but this has not been borne out by our own observations. Many other urinary invaders respond to a more or less degree; but better drugs have been introduced to cope with these infections.

Sulfathiazole has replaced sulfanilamide in the treatment of urinary infections. It is most effective against the staphylococcus and the Escherichia coli.



rather to a less extent in the other gram negative bacillary infections.

From available information, it seems that sulfadiazine and sulfathiazole are nearly equivalent therapeutically. By some, it is felt that sulfadiazine produces a smaller incidence of toxicity. Sulfamerizine is a more recent addition to the sulfonamides and is indicated in similar types of infection.

Sulfacetamide has proved useful in bacillary infections notably in many of the sulfathiazole-resistant cases.

Urinary infections by all types of organisms may be secondary to a source elsewhere in the body. In the case of coliform infections, the wall of the intestinal tract constitutes a reservoir for the offending organism. If this source can be removed, the normal resistance of the tissues of the urinary tract may be sufficient to overcome infection. With this rationale, sulfasuxidine has been used successfully in those cases of *E. Coli* infection refractory to other means of therapy. 1 gram per kilo body weight is given daily in divided doses for a period of one week and half the daily dose for 1 to 2 additional weeks. It has been found particularly useful in refractory cases of pyelitis of pregnancy.

#### Administration and Dosage

Rapid excretion is a great advantage in the use of these drugs; since a low blood level will maintain sufficient urinary concentration for effective action. A blood concentration of more than 1 mg. per 100 cc's is rarely necessary to destroy infection. Smaller doses of these drugs are therefore used than previously thought necessary. It thus enables effective treatment of those cases with diminished renal function. In acute cases, 2 grams of sulfathiazole are given daily in divided doses for two days, followed by 1 gram daily. This does not apply to sulfasuxidine which is insoluble and therefore not absorbed.

Fluids must be forced to maintain a urinary output of 1500 cc's or more. The administration of a half-teaspoonful of soda bicarbonate with each dose produces sufficient alkalization.

The patient should have a leucocyte count, Hb. estimation and urinalysis before starting treatment, and every third day thereafter. Every urine specimen should be observed grossly for evidence of hematuria. The loins should be palpated daily for tenderness. Accurate fluid intake and output should be recorded.

#### Antibiotic Agents

##### Penicillin

Penicillin was discovered by Alexander Fleming in the inoculation department of the St. Mary's Hospital, London. It is a derivative of the mould

*Penicillium Notatum*, and is one of the most promising anti infective agents derived from micro organisms. The Ca salt is more stable at room temp. than any of the other available preparations. Penicillin is absorbed by almost any route and is rapidly excreted in the urine. The maintenance of effective blood concentration is carried out by frequent intra-muscular injection of the drug. Penicillin-sensitive bacteria of urinary infection include staphylococci, hemolytic streptococci, pneumococci, gonococci and many of the spirochaetes. It does not affect the enterococci, *coli*, typhoid group, and other gram negative bacilli, such as *Proteus*, *Hemophilus Influenzae*, *Friedlander's Bacillus*, etc. A remarkable property of penicillin is its lack of serious toxicity. An occasional patient may develop urticaria with some slight elevation of temperature.

#### Dosage

Some of the early disappointments in the use of penicillin can be attributed to the small dosage rather than insensitivity to the drug. The present routine method of administration is to give intra-muscular injections at three-hour intervals. If hospitalization is impractical, it is better to use an oil and wax mixture containing 300,000 units per cc. and a satisfactory level may be anticipated for a period of 8 to 12 hours. In an acute infection, failure should not be acknowledged until the lapse of about 5 days, by which time the patient should have received from 1 to 2 million units of the drug.

In the realm of urinary infections, penicillin is particularly useful in the cortical and peri-renal types where the staph. and streptococcus are the usual offenders.

#### 8. Streptomycin

Streptomycin is an anti-biotic preparation produced by certain strains of the actinomycete, *Streptomyces Griseus*, and was first isolated by Doctors Waksman and Schatz, of Rutgers University, New Jersey. About 70% of Streptomycin is excreted by the kidneys during the 24-hour period following injection and significant urinary levels may be obtained with small doses. However, a high concentration in the urine alone is insufficient; the more critical level is that of the tissues and blood. Gram negative organisms exhibit greatest sensitivity to streptomycin. These include the *Proteus* group, *E. Coli*, *Hemophilus Influenzae*, *Klebsiella Pneumoniae* (Freidlander), and *Aerobacter Aerogenes*. More resistant organisms but susceptible to some degree are the *Salmonella* group, the enterococci including *Strep. Faecalis*, and the *Pseudomonas Aeruginosa*. It is well known that wide variations exist in the sensitivity to streptomycin among different species of bacteria.

also among different strains of the same bacteria. It is therefore imperative that the streptomycin sensitivity of the specific organism causing infection be determined at the earliest opportunity before treatment is begun.

Since development of "fastness" may be very rapid, infection should be brought under control as quickly as possible by attaining a drug concentration much greater than that to which the organism has been found susceptible. If the patient is inadequately treated the organism may become so resistant that even greatly increased dosage may fail to control infection. The drug is administered by intra-muscular injections. Two grams daily in divided doses, given at three-hour intervals for a period of seven days is sufficient for the usual urinary infection.

Toxic manifestations include nausea and vomiting, urticaria, arthralgia, myalgia and erythema. Renal and hepatic function are not impaired. When patients receive large doses for 3 weeks or more they may develop selective neurotoxic effects upon the 8th cranial nerve, tinnitus, vertigo and deafness. The damage may be irreversible. Progression of symptoms may be avoided if the drug is discontinued at the first sign of this type of toxicity.

There are no antagonisms between sulfonamide, streptomycin and penicillin. On the contrary, they may exhibit synergism. When the nature of the invading organism is not clear, and the patient is acutely ill, there is no harm in continuing penicillin along with streptomycin. In this manner gram-negative and gram-positive organisms may be accounted for. It is also practical to combine penicillin and streptomycin with a sulfonamide; but greater precautions must be taken, mindful of the hazards of sulfonamide therapy.

No one drug has yet been discovered that exerts a bactericidal effect upon all organisms in the urinary tract. It is therefore necessary to select the antiseptic best suited for the particular infection. The urologist is armed with many such drugs and more than one may be bactericidal to the same organism. Other factors, however, enter the picture. The drug which kills an organism in one patient may fail to do so in another. An organism may develop resistance to a drug which hitherto had been lethal. For these reasons, it may be necessary to try one preparation after another until infection is overcome.

With the advent of the newer drugs, other methods of treatment such as bladder lavage, continuous or intermittent, pelvic lavage, etc., have been relegated to cases complicated by other factors such as nerve lesions, prostatic hypertrophy, stricture, tumor, stone, etc. Chronic desquamative infections too, may require the

assistance of irrigation. In the female, the bladder neck and urethra constitute an important site of infection. This may be treated by intermittent dilatation and fulguration of inflammatory and granulations.

Other foci of infection may reside in the tonsils, cervix, intestinal tract, etc.; and should be dealt with appropriately.

The neurogenic bladder in the spinal injury of World War II created an infection problem which became a direct challenge to the urologist. In spite of early treatment by suprapubic cystostomy or tidal irrigation through a urethral catheter every case became infected, and in many instances the organism belonged to the urea-splitting group, most commonly the *B. Proteus* and *Pseudomonas Aeruginosa*. These organisms failed to respond to any of the antiseptics available at the time. Attempts were made to acidify the urine; but in most instances, it was impossible to maintain the P.H. sufficiently low to be bactericidal. The sulfonamides and penicillin although used in large amount proved of little value. The maintenance of large fluid intake 3000 to 5000 cc's per 24 hours without the assistance of any particular therapy constituted the most satisfactory method of treatment. With the advent of streptomycin these cases were eagerly brought forward to test the merits of the new drug. It was noted that following the administration of streptomycin the urine became sterile within 24 hours, but infection occurred within 4 to 10 days after stopping the drug. It was found that gram-negative bacilli, once exposed to streptomycin became resistant to it; so that higher concentrations of the drug were necessary to destroy the organisms. Infections could not be cleared up entirely. The number of organisms was diminished, and the patients showed clinical improvement. In this manner streptomycin succeeded in controlling infections that had previously been intractable.

It is not within the realm of this paper to deal in detail with infections of the prostate gland and urethra; but a few points of note are herewith mentioned.

#### Chronic Prostatitis

In the treatment of chronic prostatitis, massage is the most universal therapeutic measure. Its express purpose of this performance is to express the prostatic secretions and to encourage drainage. Massage too, creates an artificial vaccination because it squeezes into the prostatic lymphatics and circulation some of his own bacteria. It should be performed with gentleness and never more than twice weekly.

Dilatation of the urethra with sounds may prevent stricture formation, widen the mouth of

ducts in the region of the bladder neck, and assist in cure by improving drainage.

The application of heat by hot rectal irrigations, diathermy, or the prostatic heater, is in some cases a useful adjunct but has fallen out of favor.

Intra-Prostatic injection with 1% aqueous solution mercurochrome has enjoyed a period of popularity, but is not the answer to this problem.

None of the urinary antiseptics at our disposal has been of proven value, although all have been used at different times. It is claimed by some workers that cultures of prostatic fluid will give a useful lead as to the drug to be used. For Staphylococcal infections, nearsphenamine has been given intravenously, for Esch. Coli Mandelic acid, or one of the sulfonamides and for streptococci, sulfanilamide; latterly, penicillin has been used for coccal infections. It is again emphasized that the effects of these drugs have not been impressive.

Control of the patient's habits offers a difficult problem, but is necessary in the successful management of this condition. Alcohol is excreted by the prostate in about the same concentration as by the kidneys; therefore the patient must not drink alcoholic beverages of any description, if he is to avoid certain relapse.

It will be noted from the above that the therapeutic answer to chronic prostatitis is not yet available.

### Gonorrhea

Penicillin is the drug of choice, and should be given from the time the patient presents himself. Fewer treatment failures result from this drug than from any other known method of therapy. The injection of large doses of penicillin in oil enables the successful management of gonorrhea without hospitalization. Although 24 hour treatment often results in apparent cure, a minimum of 1,000,000 units should be given, spread over a period of about three days.

The simultaneous administration of Penicillin and sulfathiazole is considered good treatment—1 gram of the latter being given four times a day for a period of five days. This is followed by a rest of 3 days, then repeated another five days, no matter how well the patient has responded symptomatically.

If symptoms persist, then local treatment must be relied upon. 6 cc's of 5% mild protein silver are injected into the anterior urethra and retained for five minutes. This treatment is given daily until the discharge stops, and every other day thereafter for two weeks longer.

In cases of posterior urethritis, no local measures are resorted to for at least a week after the acute symptoms have subsided. Hot sitz baths

and mild sedatives are useful as well during this period.

Residual infection within the prostate gland occurs when the usual measures have failed, and the posterior urethra becomes involved. Light massage should be begun about a week after all symptoms of bladder irritability have subsided; and this may be continued for about a month.

The patient must be warned against indulgence in alcohol, sex excitation, and sexual intercourse.

Hyperpyrexia, popular during the earlier days of World War II, has been discarded.

There are no universally available proofs of cure; and mistakes are not uncommon. An asymptomatic case is not necessarily cured. In many cases, cultural studies of the lower urethra may reveal the presence of *N. gonococcus*. To assure cure the following criteria should be met:

1. The patient should be free of urethral discharge.
2. The first morning specimen of urine should be free of pus cells.
3. Culture of prostatic fluid should be negative for *N. Gonococcus*.

This test should be repeated monthly for a three-month period before cure is pronounced.

### Non-Specific Urethritis

It is stated that about 30% of patients with urethral discharge have non-specific urethritis. If to this group is added the residual urethritis that not infrequently follows gonorrhoea, then the incidence of non-specific urethritis is much greater. The characteristic features are a long incubation period and a persistent early morning discharge. Many of these cases are infected with penicillin resistant and sulfonamide-fast organisms, and do not respond to usual measures. Pre-existing prostatitis may maintain chronicity in some cases. Local treatment is most useful when the disease has entered a chronic phase. Instrumentation is carried out in cases where in spite of all measures the discharge persists.



### Recurrent Urinary Infection

Clinical recovery may occur long before the urine becomes free of pus and bacteria. This constitutes the most critical period in the management of the case because urinary infections are notorious for their tendency to recur. It is therefore wise to maintain treatment for a period after all signs of infection have disappeared. If this is neglected, infection may easily become chronic and lead to irreversible destructive lesions.

### Conclusions

1. A preliminary bacteriological survey and adequate investigation of the urinary tract are



essential for intelligent management of infection.

2. The prescribing of an appropriate diet constitutes a useful adjunct in the treatment of infection.

3. The maintenance of proper water and acid-base balance are essential where kidney damage is present or during the acute phase of an infection.

4. Although no one drug is a "cure-all," the sulfonamides and anti-biotics are bactericidal to most of the invading organisms.

5. To prevent recurrence and chronicity, it is essential that treatment be maintained for a period after the urine has been rendered sterile.

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## MEDICINE

### High Blood Pressure

C. H. A. Walton, M.D.<sup>2</sup>

The systolic pressure is a measure of the force by which the blood is impelled from the heart into the main arteries. These arteries are distensible and during diastole exert the residual impelling force in the circulation. This is the diastolic pressure. When the peripheral resistance is increased, as it is when the arteriolar bed is narrowed, the maintenance of the circulation requires a higher diastolic pressure to overcome this greater resistance. Thus in true hypertension the diastolic pressure is raised and it is the essential criterion for the diagnosis of hypertension. Invariably there is a concomitant elevation of the systolic pressure and sometimes an increase in the pulse pressure.

The systolic pressure alone is increased in such conditions as hyperthyroidism, aortic insufficiency, heart block with bradycardia and hardening of the aorta and its main branches. These may be called systolic hypertension and are not high blood pressure as ordinarily understood.

Essential hypertension in man is due to increased peripheral resistance in the arterial tree. This increased resistance results from increased tone in, and constriction of, the arterioles. This condition may be brought about by nervous or humoral influences. The afferent sympathetic pathways to the arterioles may be stimulated from the higher centres by change in environment such as exposure to cold or psychogenically as in response to emotion. Again arteriolar constriction

may be brought about by the action of a circulatory pressor substance. It is apparent that while the immediate cause of hypertension is widespread arteriolar constriction the causes of the phenomenon may be one or a combination of several of many possibilities. Hypertension is a clinical entity but in reality it is but a symptom of an underlying cause.

Hypertension is found associated with a variety of different diseases. Such diseases of the kidneys as chronic glomerulonephritis, polycystic disease, pyelonephritic contracted kidneys and amyloid disease are often associated with high blood pressure. Certain tumors of the adrenal and pituitary glands while uncommon are characteristically associated with hypertension. Increased intracranial pressure, coarctation of the aorta, hypertensive disease of pregnancy, etc., are also known to be associated with an elevated blood pressure. Their accurate management depends upon a correct and early diagnosis. However there are relatively few in number and by far the greater number of cases of high blood pressure have no apparent cause. These are referred to as Essential Hypertension.

For the maintenance of hypertension arteriolar constriction must be widespread. This constriction is not structural but is due to active contraction of the arterioles. The stimulus for this action can only come from the sympathetic nervous system or from circulating pressor substances in the blood and lymph or both. Pressor substances arise normally from the pituitary and adrenal glands and may play some part in the pathology of hypertension. There is reason to believe that there are varying degrees of resili-

1. Read at the meeting of the Brandon District Medical Society, November 6, 1946.  
2. From the Division of Medicine, Winnipeg Clinic.

motor response to nervous stimuli in man. As a group hypertensive patients are hyper-reactors.

Animal experiments have shown that experimental hypertension of renal origin resembles essential hypertension in man. Goldblatt and others have shown, in brilliant experiments, that renal ischaemia and the resultant lowering of intra-glomerular pressure did not seem to interfere with the excretory function of the kidney but led to the production of an enzyme, renin, which activates hypertensinogen, found in the plasma, giving rise to a potent pressor substance hypertension or angiotonin. The latter can be demonstrated in the circulating blood of hypertensives.

While these experiments demonstrate the artificial production of a pressor substance they do not indicate how such a pressor substance is produced in man. The absence of any evidence of renal artery disease in the early stages of hypertension and the presence of renal arteriosclerosis in the late stages (Nephrosclerosis of Volhard and Fahr) which may be secondary to the hypertension make the problem very obscure. However recent work by Smith et al has shown that in all hypertensive patients studied there is a critical reduction in renal blood flow.

Thus it would seem that although the problem is of vast complexity certain factors are important in the etiology of hypertension.

1. Primary vascular disease, perhaps involving the renal arteries—increased vasomotor response in hyper-reactors.
2. Possible increased endocrine activity from adrenals and pituitary. This is usually not evident.
3. Increased sympathetic outflow from cerebral centres.
4. Presence of an angiospastic humoral substance.

This probably arises from the kidney and is probably a result of the first three factors.

In a particular case these factors probably vary in relative importance.

Normally the systolic pressure varies greatly with physical and nervous states. In normal people it is usually below 100 mm. of Hg. during sleep and may rise to 180 or higher during sudden activity. The diastolic pressure varies much less, physiologically. As age advances the systolic pressure may rise by 15 to 20 mm. but the diastolic should not and it is probable that this is accounted for by a loss of resiliency in the larger arteries. When the diastolic pressure exceeds 100 and is persistently over 90 true arterial hypertension may be said to exist. The normal range is usually from 70 to 85. A high diastolic pressure requires resilient arteries.

In hypertension both systolic and diastolic pressures are labile at first but tend to become fixed at higher and persistent levels as the condition progresses. Their range is thus an index of both prognosis and treatment.

The onset is insidious. Most cases are discovered during routine examination in individuals past 40 years of age. Many are in good health and leading active vigorous lives and without complaint of any kind. The condition may go on for many years before symptoms of any kind occur. Slight symptoms are ignored until the patient becomes aware of his elevated blood pressure when fear causes him to attribute all future symptoms to his hypertension. However, some patients present themselves with complaints of increasing lack of energy, fatigue, headache or fullness in the head and irritability. Headache is a frequent initial complaint. It may be a dull frontal or occipital ache or internal and throbbing after exertion. Failing memory or inability to concentrate are common.

In actual fact there are no symptoms directly attributable to the high blood pressure itself. The symptoms are identical with those found in the psychoneuroses having normal blood pressures and frequently follow emotional upsets or environmental difficulties. Many patients suffer more from the knowledge that they have high blood pressure than from the condition itself. Hypertension hypochondriasis, as Osler called it, is increasing and physicians are in danger of treating hypertension symptoms. Weiss has coined the term IATROGENIC meaning "produced by the physician" for this and many other medically induced anxiety syndromes.

The real symptoms resulting from hypertension are those of its complications.

## 1. Cerebral

(a) **Hypertensive encephalopathy** is manifested by transient disturbances, aphasia, blindness, paresis of one or more limbs, epileptiform convulsions, headache and vomiting. These symptoms indicate cerebral angiospasm, small localized haemorrhages, or oedema.

(b) **Cerebral Vascular accidents**—haemorrhage or thrombosis account for 20% of the deaths.

## 2. Cardiac

Cardiac symptoms are the commonest and perhaps the most serious. The first and commonest is breathlessness on effort and later this is associated with congestive failure. Palpitation is frequent and may mean but the forceful beats of the heart, extrasystoles or auricular fibrillation.

The heart is enlarged clinically in half of the late cases and may be immense. The enlargement is due to dilatation and hypertrophy occurring

only in the left ventricle. This is the result of long continued high pressure.

Coronary artery thrombosis accounts for 20% of the deaths and circulatory failure accounts for 45%.

**3. Renal**—failure accounts for about 10% of deaths. It is heralded by increased frequency and nocturia. This type is often impossible to differentiate clinically from Bright's disease. Impairment of renal function is of grave importance in hypertension but is not common.

**4. Retinal Changes**—include arteriolar narrowing and the presence of haemorrhage and exudate in the retina. If near the macula sudden loss of vision may ensue.

With the possible exception of epistaxis there are no symptoms pathognomonic of hypertension. The early symptoms are indistinguishable from those of the psychoneuroses and the later ones are those of the complications. Obviously all of them may occur in cerebral, cardiac or renal disease not associated with essential hypertension. However, long continued high blood pressure will lead to one or more of these complications eventually.

Essential hypertension cannot be cured though as has been pointed out it can be made worse for the patient. There is no doubt that persistent high blood pressure increases mortality considerably. However, after middle age the prognosis is not nearly as gloomy as has been thought. The average case occurring in middle age may be expected to live from 10 to 20 years though when it occurs in younger patients it may be fulminating and survival may be very short. If the condition is discovered accidentally in an apparently healthy person and if it is not notably progressive the prognosis is good and this fact has a most important bearing on treatment.

Nearly 90% of all cases of essential hypertension are benign. That is, the condition progresses slowly over many years. Treatment of these is entirely symptomatic and no treatment may be required for many years.

1. Reassurance is of the greatest importance.

2. Modification of the patient's environment, psychological and physical, is often of value. If the environment demands great emotional or physical stress periodically the patient's condition will be influenced unfavourably.

3. The diet should be normal. Weight should be kept within normal limits and protein should not be limited. Attention should be given to the accessory food factors especially to members of the Vitamin B group in older patients.

4. Exercise in moderation is probably beneficial but moderation of course is essential.

5. Physical and emotional rest in normal amounts is important and attention to the patient's

habits of living and general hygiene is necessary.

6. The vaso-dilators which have but a transient effect on the level of the blood pressure should not be used except for some special purposes such as angina pectoris. The patient must be able to live within his exercise tolerance by the use of various vaso-dilators are often of use for relieving anginal pain.

#### 7. Treatment of Complications.

(a) **Heart Failure**—is one of the commonest complications of hypertensive disease and is usually recognized at first by dyspnoea on effort. The usual measures such as Digitalis, limitation of fluids and the use of diuretics are indicated.

(b) **Coronary occlusion** is an acute medical emergency and its treatment is the subject of a separate study.

(c) **Renal Failure**—When renal failure occurs there is really very little that one can do to influence the subsequent course. When Nitrogen retention occurs protein in the diet should be limited to basal requirements. Sodium should be restricted and cathartics may be of value.

(d) **Cerebral**—Headache and the other cerebral manifestations can sometimes be relieved by rest, sedatives, venesection and analgesics. CHloral Hydrate in doses of 20-30 grains is often the most useful.

8. Lowering of blood pressure has been attempted by various drugs other than the vaso-dilators though many extravagant claims have been made. Most of these are useless and without pharmacological basis. In judging such drugs one must realize that the psychological effect on the patient and the physician is of great importance. Secondly, in the vasospastic stage of the disease the blood pressure is very labile and may vary very greatly. It is therefore foolish to attribute a drop of 20-30 mm. systolic as due to a drug when it is really due to an allaying of the patient's fears or to his emotional rest with sedation.

Potassium thiocyanate is capable of maintaining a lowered blood pressure in a proportion of hypertensives. It is effective only if an adequate level of the drug is maintained and it is generally found that this level must be five to ten mgm. per cent. In those cases in which there is an effect on lowering of the blood pressure hypertension recurs as soon as the drug is withdrawn. Therefore the drug must be continued indefinitely in those cases in which a favorable effect is obtained. Apart from the objective evidence of lessening of blood pressure it is rather difficult to evaluate the effect of Potassium thiocyanate. Bearing in mind that the symptoms of early hypertension are indistinguishable from those of anxiety it is sometimes difficult to justify the use of the drug.



in the presence of the complications of hypertension. Unfortunately the value of Potassium thiocyanate therapy in the presence of such complications is very doubtful. If the drug was not toxic these considerations would not be of great importance. Unfortunately the drug is markedly toxic and serious accidents may result from its use. If the blood level of the drug exceeds 12 mgms. per cent toxic symptoms occur rapidly. However, such toxic symptoms may also occur with lower blood concentrations so that a satisfactory therapeutic level is often very close to the margin of toxicity. The dosage of the drug must be checked periodically by repeated estimations of its blood level.

Many cases of benign hypertension progress slowly and terminate fatally in the seventh or eighth decade of life. Obviously if this progression could be prevented or the disease cured without great risk, life would be prolonged. Until suitable therapeutic measures become available the treatment of benign hypertension must continue to be symptomatic.

Malignant hypertension is the name given to that ten per cent of cases which manifest rapidly developing symptoms and an early fatal outcome. Thus it only differs from the benign form in degree. It is of two broad classes.

1. Benign cases, usually after middle life which suddenly becomes rapidly progressive.

2. Young hypertensives who progress from normal to a fatal outcome in a few months or years.

The benign hypertensives in middle or later life do not present urgent problems of treatment and until our fundamental knowledge becomes more complete the problem of their care is a symptomatic one. Malignant hypertension, especially in younger patients, is an urgent problem. Medical treatment offers little or nothing. With the success of sympathetic surgery in peripheral vascular disease it is not surprising that surgical attack on hypertension has developed.

### Surgical Treatment

It is less than sixteen years since the first operation for hypertension was done. Adson first approached the problem by laminectomy and section of the anterior roots. Later he attacked the splanchnics subdiaphragmatically. In 1933 Peet introduced his operation of splanchnic resection and removal of 10, 11 and 12 dorsal ganglia, above the diaphragm. He has continued to use this technique ever since. Crile introduced the operation of coeliac ganglionectomy in 1936. More recently Smithwick (1940) advocated a more extensive splanchnic denervation in which he combined supra and infra diaphragmatic exposure of the splanchnic nerves and the dorsi-lumbar sympathetic chains. In this two stage operation the

sympathetic trunks are resected including the ganglia of the ninth to twelfth thoracic segments and the first and second lumbar segments together with the greater, lesser and least splanchnic nerves on both sides as far as they can be reached. This extensive procedure not only stops vasoconstrictor impulses to the splanchnic area but to the lower extremities as well. Thus it is hoped to relax the huge bed of arterioles in the splanchnic area and lower extremities and permit a lowering of the systemic blood pressure. Further this operation interrupts the sympathetic nerve pathways to the kidneys and adrenals. If renal ischaemia is really a factor in the origin or maintenance of a humoral pressor substance benefit might also be expected from this procedure. While there is little evidence that the adrenals play a great part in this disease severance of their afferent nerve supply may be beneficial.

There are a great many theoretical considerations regarding these extensive operations and this is not the opportunity to explore them. However, as a result of more than ten years experience, certain general observations can be made. Crile's operation is not widely accepted on theoretical and practical grounds. Adson has discontinued his method. Peet's operation continues to have success in his and in other hands. Smithwick's operation is rapidly becoming the accepted method. His results have been striking, as have those of Peet, and there can be no doubt that extensive sympathectomy offers the most useful treatment for severe hypertension which we have at present.

Smithwick's mortality is in the region of three per cent. Significant improvement in blood pressure has been secured in more than 65% and there has been an even higher proportion of symptomatic improvement even without lowering of the blood pressure. Recently Paul White has shown that extensive electrocardiographic changes can be reversed by this operation. A most interesting observation has been that the retinal arterioles sometimes show marked regression suggesting a systemic as well as a splanchnic effect.

It must be remembered that these outstanding results have occurred in skilled and experienced hands. A much higher mortality and less satisfactory clinical results are apt to occur in inexperienced hands.

While the criteria for selection of suitable cases for operation are far from complete certain generalizations can be given.

1. **Age**—seldom accepted over 50 and in general is best before 40.

2. **Eyegrounds**—best results are obtained with the lesser grades but all grades might be accepted.

3. **Blood pressure**—lability is most desirable—a fixed high tension being unsuitable. A marked

fall of both systolic and diastolic under sedation (Sodium amytal gr. iii every hour for three hours) is of the greatest prognostic importance. Those patients having a low pulse pressure have a more favourable prognosis.

**4. Heart.** Congestive heart failure is of course a contra-indication but dyspnoea of effort or angina has often been benefitted. Electrocardiographic changes occurring before symptoms are a strong indication for operation.

**5. Cerebral** accidents have a less favourable outlook but have been benefitted on occasion, especially in the younger age group.

**6. Renal function** must not be too greatly impaired. A urea clearance of better than 40% and a concentration power of up to 1.020 is desirable. Non protein Nitrogen should not exceed 45 mgm.

### Results

Mortality is low in experienced hands.

Blood pressure is lowered significantly in a good proportion and remains low.

Symptoms may be greatly benefitted even when blood pressure is not lowered.

Cardiac changes short of decompensation may be reversed.

Eye grounds sometimes return to normal.

Expectancy of life is greatly increased. Morbidity is lessened. Many severe hypertensives have been able to return to a useful occupation.

It is extremely difficult to give a more definite set of indications for this formidable operation and yet it offers much in carefully selected cases. Each case must be accepted on its merits and the experienced physician and conscientious surgeon can decide if surgery is desirable under a particular set of circumstances. Sympathectomy offers a great deal to a carefully selected and widening group of cases of malignant hypertension. There are many groups of cases from both Parkland and Smithwick's clinics and other centres which have been followed for long periods of time which have had most gratifying results. Progressive and asymptomatic benign hypertension should probably not be operated upon but severe progressive hypertension in patients up to 60 years of age certainly deserve very careful consideration for this useful if formidable procedure.

This has been an exceedingly sketchy account of a most important subject. It is probable that hypertension is two to three times as great a cause of death as cancer. Perhaps such a discussion as this may excite some further thought and discussion.

## Book Review

### Diabetes

Col. H. J. John, of the Cleveland Clinic, has been studying diabetes since before the days of insulin. His cases are numbered in the thousands, and so he can speak with authority. From his experience with medical officers during the war, he felt that there was need of a book which would set forth clearly and simply the principles underlying the successful treatment of diabetes—a book that would make it possible for the busy doctor to understand the problem and to apply the correct treatment easily and intelligently. These things he has accomplished in this book of 300 pages, in which simple instruction is rendered still more clear by 73 charts and 44 tables.

The first two chapters are devoted to the diagnosis and differential diagnosis of diabetes. The next two consider in detail the value, significance, variations and interpretation of blood sugar findings and the glucose tolerance test.

The chapter on treatment has, as its keynote, the danger of hyperglycemia. It is stressed that hyperglycemia produces a steady destruction of islet tissue, that every day such hyperglycemia is allowed to persist means added damage to islet cells. The author believes that proper treatment

can stop the damage before the changes become irreversible and that many, if not most, of the cells can be restored to normal function. The main object of treatment should be this restoration rather than the mere relief of symptoms. Symptoms are of little value because they can exist in the absence of diabetes. Diabetes, on the other hand, can exist in the absence of symptoms, and he points out cases in which the blood sugar was abnormally high but where the usual symptoms of diabetes were not found. He does not regard glycosuria as ever desirable but sees in it an evidence of hyperglycemia which is always harmful.

Diet and insulin are discussed and also the treatment in general, but instruction in treatment is imparted chiefly by the consideration of a number of cases. In each instance the state of the patient, the rationale of the treatment prescribed and the results obtained are elaborated so as to give a guide to individual problems and clarity is added by the accompanying charts.

The causes and control of exacerbations and the treatment of coma are also considered with the aid of case charts and tables. There is a table of the differential diagnosis of coma. The special problems of surgery and diabetes are dealt with in a separate chapter. The care of the patient

# ANAESTHESIOLOGY

Edited by P. C. Lund, M.D., Anaesthetist, Deer Lodge Hospital

## Notice of Meeting

The next meeting of the Manitoba Division of the Canadian Anaesthetists' Society will be a Supper Meeting at the Medical Arts Club, Tuesday, April 1, at 6.15 p.m.

## Program

1. Obstetrical Anaesthesia and Analgesia. The Obstetrician's Viewpoint.

Dr. Sol Kobrinsky.

2. A Symposium on Obstetrical Anaesthesia.

Dr. M. Bennett.

Dr. R. Letienne.

Dr. Atchison.

3. Business Session.

## Abstract

**The Importance of Autopsy in Deaths on the Operating Table.** Gilbert Brown; Anaesthesia and Analgesia, May-June, 1946.

The author in this paper makes a plea for the performance of an autopsy on all patients who may die on the operating table. When such a death occurs it is frequently impossible to tell the exact cause of the fatality, and it is apt to be classed as "Cardiac Failure," "Respiratory Failure," or "Shock." This may be due to fear of the unpleasantness of a coroner's inquiry and a publicity which may lessen the confidence of the public in the hospital, or the surgeon and anaesthetist concerned. Consequently little endeavour is made to obtain permission for an autopsy.

In 1934 the Honorary Staff of the Royal Adelaide Hospital appointed a Subcommittee on Anaesthetic Fatalities to inquire into all deaths occurring under anaesthesia. The scope of inquiry was later increased to include deaths in which the anaesthetic may have been a contributing factor. In an analysis of the first seventy-six deaths inquired into by this Subcommittee there has been an autopsy in twenty-six, a partial examination in one and a partial examination on the table in one. In five of these cases the postmortem examination has shown the cause of death to be some condition that was quite unexpected.

Of these seventy-six deaths, forty-eight occurred during the operation and twenty-eight at some time from a few minutes to eight days after the operation.

The following five cases are examples of deaths on the operating table in which the cause of death was unknown until an autopsy had been performed.

**Case 1.** W.B., age 13½ years, was admitted to hospital complaining of pain in his left side. Three and a half weeks previously, while trying to jump a fence, he fell and hurt his left side. He remained in bed for a week and then returned to school. Four days later he went back to bed and remained there until he was taken to the hospital. He was given ether by the open method for an exploratory laparotomy for (?) enlarged spleen. A large abscess was found connected with a perforation of the stomach and adhesions to the spleen and omentum. The abdomen was drained. As the wound was being closed, respiration ceased and he died.

Autopsy showed a massive pulmonary embolus at the bifurcation.

**Case 2.** W.F., age 58 years, fell on his right hip and shoulder and fractured the neck of his femur. Ethylene and oxygen was given on the same day for reduction and fixation of the fracture. His condition was good under the anaesthetic, except that he was once cyanosed for a short time. After the operation had been in progress for twenty-five minutes, his respiration ceased suddenly and resuscitation was unavailing.

Autopsy showed fat embolism of the capillaries of the lung.

**Case 3.** R.W., age 30 years, was driving a lorry which crashed into the back of a tram car. Four tons of merchandise fell forward, pushing the cabin of the lorry upon him. He was admitted to hospital suffering from fracture of the lower jaw, fracture of the right clavicle and lacerations of the chin, inside the mouth, the tongue and below the clavicle. An anaesthetic was given in order to suture the lacerations and to control the bleeding. Anaesthesia was induced with ethyl chloride, and ether and this was followed by ether by the endopharyngeal method through a nasal catheter.

There was free bleeding from the lacerations in the mouth which required the use of continuous suction. Anaesthesia was light and after fifty minutes it became so light that the patient struggled and had to be restrained by four people. The mask was reapplied and ether dropped on it, in addition to that given through the nasal tube. While the patient was struggling the respiration suddenly ceased, the patient became cyanosed and died.



### Autopsy

There was a fracture dislocation of the odontoid process. It is probable that this fracture was dislocated forward during the struggling immediately prior to his death and that death was due to pressure on the medulla. The fracture was unsuspected and no precautions were taken to prevent him from moving his neck.

**Case 4.** G.C., age 26 years, was given nitrous oxide and oxygen in the Out-patient Department for pelvic examination. The anaesthetic was begun with 95 per cent nitrous oxide and then changed to 80 per cent with a little ether. Eight minutes after the anaesthetic began, the respiration ceased, "Color went off to blue" and the patient died.

### Autopsy

Acute pulmonary edema was present with irritation of the bronchi and trachea which were filled with frothy mucus; there was ten ounces of blood in the heart and great vessels and intense venous congestion. Death was due to acute pulmonary edema caused by anoxia.

In this case there was a previous history available which might have averted the calamity; unfortunately it was not inquired into. So the cause of death was unknown until the autopsy had been performed.

### Past History

At the age of 5 she had an injury to the lower jaw which resulted in ankylosis at the condyle with only a very small separation of the teeth. This caused lack of growth in the mandible so that, as she grew older, the lower jaw was small and undershot. From time to time she had operations on the condyle, excision of the condyle, removal of a wedge of bone from the angle of the jaw, removal of an unerupted molar by external incision. Also, an operation for separation of the soft parts over the chin and an epithelial inlay to allow a large mould of dental compound to be introduced and give prominence to the chin. Six months before her death she was given an anaesthetic for an operation on her antra. But it was found that the teeth could not be separated enough to insert an airway or to pack the throat and the operation had to be abandoned. She had at least ten operations under general anaesthetic. On each occasion the administration of the anaesthetic was difficult owing to the position of the jaw, the inability to separate the teeth and the lack of full muscular control of the tongue. Sometimes oxygen was given under the ether mask and it was always necessary to hold the tongue with forceps during the induction. This traction was either continued throughout the operation or else an endotracheal tube was passed.

It was usually possible to intubate by the method through the nose.

**Case 5.** C.S., age 58 years, was a diabetic the sugar was under control. An anaesthetic given for a drainage of an abscess in the neck. Eight cubic centigrams of ethyl chloride was administered and this was followed by ether under an open mask. After ten to fifteen breaths of ether vapor, the respiration suddenly ceased and the patient died.

### Autopsy

There was a large abscess in the neck which was an extension of an abscess round the right and left side of the lower cervical vertebrae. The body of the sixth cervical vertebra had been destroyed practically right through by the abscess and was replaced by a cavity filled with pus. There was sudden cessation of circulation and respiration. This was probably due to sudden pressure on the spinal cord, caused by destruction of the vertebral body and so leading to undue mobility of the vertebrae and neck when the muscles were relaxed by the anaesthetic.

The foregoing data show that death under an operating table is frequently due to causes which were not suspected until disclosed by a postmortem examination. In the absence of an autopsy, many deaths may have been wrongly classified, embolism, a falsification of statistics and a loss to medical research. In an accompanying list the cause of death in 76 cases was given. The author, however, points out that it is more than probable that many of them were wrongly classified which might have been prevented had an autopsy been performed in each case.

### Abstract

**Multiple-Dosage Curare Technique and Analgesia.** Burford, G. E. *Anaesthesia and Analgesia*—January, 1947.

The utilization of curare is at the present moment a matter of foremost interest in anaesthesiology. The value of the drug has been evident by numerous writers. The technique provides the greatest safety during administration has not been as clearly established.

Accumulated experience has forced us to adopt one fundamental rule of technique while using curare. It is this: Keep the patient breathing. In my opinion, the administration of curare is a relatively safe procedure, possibly safer in comparison with other major anaesthetic techniques provided this seemingly absurdly simple rule is not violated.

Compliance with this admonition is no easy matter it would first appear. The anaesthetist frequently encounters variations in response

effect of the drug, depending on the age, general physical condition, the type of surgery being performed and the accompanying anaesthetic agent being administered. Beside this, either overconfidence or unfamiliarity with the drug lead to the occasional misjudgment of dosage, resulting in apnoea and the necessity for artificial respiration or resuscitation.

During recent years there has arisen among anaesthesiologists a complete contempt toward the significance of the development of apnoea during anaesthesia. This feeling has been abetted since the introduction of curare by the frequency of occurrence and ease of onset of a period of apnoea after the employment of this drug, and the apparently self-limiting duration of the period when it is tidied over by artificial respiration. In a great percentage of the instances this feeling of safety is correct, but the percentage is not high enough to justify an unnecessary procedure. For the development of apnoea as an effect of curare can be prevented by suitably planned technique.

In our own work both the individual dosage and the interval between injections were reduced. Amounts of one-half and even one-quarter cubic centimeter (10 to 5 units of intocostin) were used and the elapsed time between injections shortened, on indication, to as little as three and four minutes.

The resulting increase in the number of injections into the veins of each patient required the development of means for facilitating the procedure. That was accomplished by routinely establishing venoclysis on all patients receiving curare. In most instances the use of parenteral fluids, including blood, was already planned. Puncture of the tubing near the vein by a fine gauge hypodermic needle then made the numerous injections a simple matter.

It appeared at first as foolish to stress this small alteration of technique, based simply on the reduction of individual doses, as it did to emphasize the preservation of active respiration already mentioned. However, several distinct advantages were made readily available.

In the first place the anaesthetist found himself thinking in terms of the employment of the smallest possible amount of curare that would produce an effect, rather than the largest possible amount that might be tolerated without danger. This change was comparable to the favorable one occurring in gas anaesthesia when cyclopropane was introduced. Then for the first time a gas could be supplied as dictated by the signs of surgical anaesthesia. It was no longer necessary to work with an overwhelming amount of the agent.

There were other technical and physiologic reasons for the advantages of this method. Technically

the multiple small-dosage utilization of curare produced a progressively depressive and easily followed effect on respiration which gave the anaesthetic procedure a familiar appearance. The curariform effect of ether on skeletal muscle has been demonstrated by Cullen's group and earlier by Meltzer. For this reason the progressively depressive effect on the musculature of respiration when produced gradually by curare appeared in many ways comparable to the familiar descending ether effect on respiration that is the most fundamental observation in anaesthesia. This similarity gave confidence and a sense of safety to the trained observer, even to one working for the first time with curare, as he watched the progress either up or down of these basic muscular respiratory phenomena.

There are, of course, moderate differences in the character of deep ether and deep curare respiration. These are due to the development of a considerable amount of reflex drive to the respiratory centre during the administration of ether, as well as to the varying adrenergic effects produced by the drug. Diaphragmatic activity falters in a less obvious manner under curare. The contractions show neither the obvious jerk nor the moderate increase in rate characteristic of a preparalytic ether effect. Nevertheless the basic similarity will not be missed if careful observation is made for the signs of progressive intercostal paralysis followed by those of increasing paresis of diaphragm and activity of the myloheid.

With this course of events in mind, the purpose of the multiple small dosage technique was apparent. It made more likely that changes produced by curare on the respiratory musculature occurred gradually and deliberately enough to be observed, followed and controlled.

Physiologically, there were two sound reasons for developing a technique aimed at keeping the patient breathing. Curare possesses actions other than the primary one of blocking the activity of skeletal musculature. In particular several observers noted a direct depression of the central nervous system involving the brain stem and the respiratory reticulum. This development was a late effect, coming on at about the time that spontaneous respiratory activity ceased, or usually somewhat later. It was therefore a fair assumption at this stage of our knowledge that an individual under the effect of curare who was still able to carry on spontaneous respiration remained in the relatively safe phase of curarization which is characterized simply by impairment of the responsiveness of skeletal musculature to various forms of stimulation.

Secondly it was most likely that the patient anaesthetized under any technique who was

breathing spontaneously was better off than the one in apnoea and undergoing what is known as controlled respiration. In certain instances in our experience controlled respiration appeared to impair the quality of the circulation. Controlled respiration will undoubtedly maintain life for many hours, and is an absolutely essential maneuver in the practice of anaesthesiology. Yet all forms of artificial respiration are apparently employed at the cost of producing an unpredictable distortion of the pattern of the blood and tissue oxygen and carbon dioxide levels that may at

times be dangerous to the life of the individual.

Another somewhat unrelated advantage of continuous venoclysis and multiple small-dose technique lay in the ability to employ intococaine and pentothal on the same patient without special concern. Ordinarily these two drugs acted on each other to form a fine precipitate.

Although this usually redissolved, the precipitate caused the anaesthetist some uneasiness. When the two drugs were injected alternately through the venoclysis tubing no precipitate formed. This possible hazard was eliminated. P. C.

## S U R G E R Y

Edited by S. S. Peikoff, M.D.

### Some Observations on Vagotomy For Peptic Ulcer With a Discussion of Three Selected Cases

W. R. Govan, B.A., M.D.

During the last half century, a variety of surgical procedures have been devised for the treatment of intractable, but otherwise uncomplicated, peptic ulcer. To date these efforts have fallen somewhat short of perfect.

Allen states that twenty out of every hundred patients suffering from peptic ulcer do poorly under non-operative methods of treatment. A considerable number of this group develop haemorrhage, perforation, or other complications requiring surgical intervention. The remainder, estimated by Allen and Welch as 10%, stand out as medical failures or as intermittently sick patients, who, tied down to their diet and medication are still far from well.

It has been suspected for many years that the nervous system plays an important part in the production and maintenance of chronic peptic ulcers. Cushing reported a greater incidence of acute perforating ulcers of the stomach and duodenum in patients recovering from certain operations on the brain than mere incidence could allow. These findings have been confirmed by others. It is a well known observation that peptic ulcer patients are worse during periods of stress. Such experiences have led many to believe that there is a definite relationship between the activity of the cerebral cortex and the functional activity of the stomach.

#### Experimental Work Leading up to the Operation of Vagotomy

Pavlov, working with dogs, shows that following resection of both vagus nerves, gastric secretion in response to sham feedings and conditioned reflexes was lost. This bit of evidence alone sug-

gests that the vagus nerves constitute one of the main pathways between the cerebrum and the upper gastro-intestinal tract. Other possible pathways include the sympathetic and somatic nerves and circulating humoral factors. Ivy and his group at Northwestern University have done extensive studies on the enteric hormones.

**Atropine**, a most effective drug in the treatment of early peptic ulcer, apparently acts indirectly blocking parasympathetic effects. If the parasympathetic nerves were resected, one might reasonably assume that a complete atropinization of the area had been secured, and conclude that such a procedure might help the patient with peptic ulcer.

**Stahnke**, in 1924 in experiments involving repeated electrical stimulation of the vagus nerve produced typical peptic ulceration in two of his dogs.

**Beaver and Marin**, in 1931, using the Moore and Williamson operation produced ulceration in 95% of cases. But in those animals whose vagus nerves were previously sectioned, ulceration did not occur.

Pure gastric juice as it is secreted by the stomach has been shown experimentally to have the capacity to digest all living tissue, including the walls of the jejunum, duodenum, and stomach itself.

**Dragstedt** demonstrated that ulcer patients have an excessive and continuous secretion of gastric juice, and that this juice was often more normally acid. This hypersecretion occurred during resting and night hours when the stomach was not protected by neutralization of acid by bile. He considered the possible causes of this hypersecretion, and stated that while it may be related to a continuous absorption of chemical gastric secretory stimuli, such as histamine, it seems probable that abnormal activity of the vagus secretory mechanism is responsible.



To Lester Dragstedt of Chicago, should go the credit for developing and proving the efficacy of Vagotomy in the treatment of peptic ulcer. Working on dogs he found that section of the vagus nerves to the stomach reduced the secretion of gastric juice to a half or even quarter of the normal level.

Dragstedt states that the data obtained so far in man suggests that the hypersecretion of gastric juice in ulcer patients is neurogenic in origin, and that consequently a comparatively greater reduction should follow vagus section in man than in lower animals. With all this experimental evidence to support them Dragstedt and others began Vagotomy for peptic ulcer.

### Technique of Operation

Dragstedt's technique to a large extent was followed in our two cases and was briefly as follows:

The patient is prepared and placed on his or her right side on the operating table and draped for a left thoracotomy approach. Under controlled, intratracheal gas and oxygen anaesthesia the 8th rib is removed. The intercostal nerve is then avulsed in order to help prevent the complication of post-operative pain in the left chest. The pleura is then incised and the left pleural space thereby opened. The inferior ligament of the lung is clamped and cut and the left lung is collapsed. Rib spreaders are used to ensure good vision. The opening in the pleura is continued in order to expose the oesophagus. The oesophagus is then carefully mobilized and the vagus nerves dissected out—the left running anterior, and the right running posterior to the oesophagus. Care is taken to dissect out all fibres of both vagi from a point just inferior to the root of the lungs down as far as the left diaphragm. This method is followed by Moore of Boston. The nerves are then sectioned by excising some 8 cms. of both nerves. The proximal ends are ligated with fine silk and sewn into the pleura—the distal ends are likewise ligated and sewn into the diaphragm. During the operation the lung is blown out by the anaesthetist every 15 minutes. This procedure helps to prevent post-operative pneumonia. The lung is finally blown out as the pleura is closed. A catheter is left in the pleural space in order to aspirate air when the muscle, fascia, and skin layers are closed. In our cases 100,000 units of Penicillin was injected through this catheter. The operation is not technically difficult. A highly skilled anaesthetist is invaluable. The patients are encouraged to get out of bed on the first post-operative day. Carbon dioxide for hyper ventilation, and breathing exercises, are essential features of post-operative therapy.

### Post-Operative Course

In an analysis of thirty-nine of his early cases Dragstedt gives the following reports: Pain along the rib margin was a troublesome development in many of the early cases. This has been largely prevented by the division of the intercostal nerve at the posterior margin of the wound. Thirty of his thirty-nine patients had duodenal ulcers, two had gastric ulcers and seven had gastro-jejunal ulcers.

Eight of the duodenal ulcer patients had a gastro-enterostomy in addition to the vagus section because of high grade pyloric stenosis. Only one patient failed to obtain striking and persistent relief of symptoms. The early patients have all remained well after two to two and a half years on unrestricted diets and without medication.

Both gastric ulcer patients have done remarkably well—one has been cured of his disease clinically and radiographically. The other has shown marked improvement. Vagotomy reduced the secretion of gastric acidity in the empty stomach at night by fifty to sixty per cent.

The mobility of the stomach and the hunger contractions were markedly reduced by vagotomy.

Dragstedt made the following conclusions at the end of his report on thirty-nine cases.

(1) A striking and persistent relief of ulcer distress had been almost uniformly secured, with gain in weight and radiological evidence of healing of the lesions.

(2) Section of the vagus nerves had no effect on the secretory response of the stomach to histamine or caffeine but abolished the response to insulin hypoglycemia and sham meal.

(3) The tonus and motility of the stomach were decreased but not abolished by the operation.

In a report of the first twelve cases done by Moore, Chapman at the Massachusetts General in Boston the following results were noted:

(1) As regards healing of the ulcer, in the uncomplicated cases of duodenal ulcer—no crater was visible radiologically a week to ten days after the operation. Two cases of stomal ulcers, complicating gastro-jejunostomy, required three weeks for complete healing. Following operation, as a general rule, patients were allowed to eat and drink anything they wished, including alcohol and coffee, since it was believed that the operation would not be put to an adequate test if a patient were carried along on a conscientious medical regime.

The X-ray changes following vagus resection may be described as consisting of prolongation of the initial emptying of barium into the duodenum and marked prolongation of the final emptying time of barium from the stomach.

The effects of insulin on gastric secretion have been mentioned by Weinstein as being a test for vagus section. They state that unless this reaction is abolished the vagus nerves cannot be regarded as having been adequately sectioned. In all these patients studied post-operatively there has been no insulin response.

The Insulin test for vagus section is based on the fact that the hypoglycaemic state produced by insulin causes a transient gastric hyperacidity. This hyperacidity is abolished after section of both vagi.

Grimson gives the following results of clinical investigation of the therapeutic and physiological effects of vagotomy at Duke Hospital, Durham, North Carolina. Thirty-five patients with refractory peptic ulcer were treated.

The Surgical technique was much the same as that of Dragstedt. The clinical effect of vagotomy has been encouraging. Patients were exceptionally well pleased, ate normal diets, were relieved of symptoms of ulcer, and gained weight. Their appetites were improved. All ulcers have healed with no recurrence as yet.

Complications due to decreased motility and the presence of inflammatory or scar tissue about the ulcer site occurred. The patients had acute dilatation of the stomach. Five required some form of gastroenterostomy either at the time of the vagotomy or later—50% of the patients experienced some degree of epigastric distress after eating for the first several weeks.

All patients developed temporary intercostal pain even though the intercostal nerve at the site of the incision had been avulsed during operation. Vagotomy has been most gratifying in patients with stoma ulcer.

The physiological changes induced by vagotomy have been remarkable. Motility of the fasting stomach has been consistently decreased below normal and in some patients temporarily abolished.

Some recovery of motility was evident in balloon studies made three months and one year after operation. Ulcer pain was relieved by the time the patient awakened from anaesthesia.

After vagotomy—X-ray studies of the stomach have revealed a delay in emptying time in most patients, there being a retention of some barium for four to six hours or longer. This delay in emptying decreased considerably at the end of three months.

The volume of secretion of the fasting stomach was consistently reduced. The acidity of the secretion of the fasting stomach was also markedly reduced. Other tests indicate that vagotomy not only reduces the amount of acid secreted by the stomach, but also facilitates neutralization of acid. Peristaltic activity of the oesophagus and

duodenum is not significantly altered by vagotomy.

The decrease of acidity was least in patients who had the most obstruction by scar tissue and the greatest delay in emptying of stomach. In these cases it seems reasonable that vagotomy should be combined with pyloroplasty or gastro-jejunostomy if the maximum benefit is to be obtained.

## Case Reports

### Case I.

Mr. M., age 44, a worker in a woollen mill, married.

His complaint was epigastric pain, worse at night—not completely relieved by light food and alkalies. His past history revealed a perforated duodenal ulcer in March, 1945. Examination negative except for carious teeth and a haemoglobin of 65%.

Gastric analysis showed a free acidity ranging from 18 to 85 and a total acidity ranging up to 100.

The radiologist reported as follows: Stomach is fish hook in type, showing hypertrophy of gastric mucosa. The duodenal cap is grossly deformed and there is a large crater demonstrated. At 12 hours there is a 25% gastric residue. Summary: Duodenal ulcer—large crater present with obstruction.

In view of the deep crater, high acidity, comparative youth and persistent pain even after continuous treatment, we recommended a section of both vagi for this man.

He was admitted to St. Joseph's Hospital on Dec. 16th, 1947, and given a Graham diet through a duodenal tube. Gastric analysis after ten days in hospital showed a free acid of fifty-four and a total acidity of seventy (70). He still complained of slight epigastric pain. X-ray revealed no obstruction at pylorus. A vagotomy was performed on Dec. 27th.

Gastric analysis immediately following operation showed no free acid and a total acidity of five. The patient got out of bed on the following day and was put on a bland diet.

The patient had slight pain in the left upper abdomen post-operatively and a moderate cough. The wound healed uneventfully.

Mr. M. was discharged in excellent condition on Jan. 6th—ten days post-operatively. On Jan. 22nd Mr. M. reported to the office. He stated that he had absolutely no epigastric pain or distress and had gained weight. He had been eating most foods.

Radiological exam was as follows: Stomach is fish hook in type, regular in outline. Duodenal cap fills well and looks perfectly normal. There is a 30% residue after four hours.

Gastric Analysis showed free acid as follows:

0	2	8	27
26	10	26	53

#### Case II.

Mr. H., age 46, had a Gastro-enterostomy for duodenal ulcer with obstruction in 1932. For the past few years he had a typical ulcer history of pain—food, relief, with marked tenderness over stoma but no definite ulcer crater. Acidity was within normal limits and we advised vagotomy. He was admitted to St. Joseph's Hospital on Jan. 14th. Duodenal feedings were given pre-operatively. Vagotomy was done on Dec. 27th. Post-operatively he developed considerable pain in the left chest with cough and sputum. X-ray of the chest revealed slight pleural effusion in the left base. He was discharged on Jan. 22nd.

Radiological examination of the stomach and duodenum on Jan. 27th was reported by the radiologist as follows: There is no fluid in the chest now—the stoma is working well and is not tender to pressure. There is no obstruction or other evidence of stomal ulcer.

#### Case III.

Mr. K. had a long history of a duodenal ulcer with nocturnal pain. Fluoroscopy of the stomach and duodenum on Jan. 6th was as follows:

Duodenal cap markedly deformed suggesting ulceration. No demonstrable crater. His gastric acidity ranged as high as sixty-six. We advised vagotomy. This was carried out on Jan. 16th. He made an uneventful recovery, being up and around the first day post-operatively. Gastric Analysis on Jan. 23rd showed no free acid and a total acidity of fifteen. On Jan. 25th an insulin test was carried out which confirmed the success of vagotomy. Already this patient feels considerably better and has no pain.

At present, Lester Dragstedt has reported some 40 cases at Chicago. Grimson at Duke University, Moore in Boston, and Dixon and Clagett at the Mayo Clinic, have also reported similar series.

Thus far the results have been uniformly gratifying. For the most part the period of observation has been too short to permit a final evaluation of the procedure. Dragstedt states

that his first twelve cases, operated upon a little over three years ago, are still well, take no medication, and are under no dietary restrictions. The night secretion is still within the normal range, and tests of gastric secretion by sham meal and insulin hypoglycemia show that there has been no regeneration of the vagi.

#### Conclusions

From a review of the present available literature it is difficult to state a certainty as to what place this operation will ultimately occupy in the surgical armamentarium.

It would seem that there are two ideal groups of cases for vagotomy:

(1) Patients who have had other surgery, such as pyloroplasty, Posterior gastro-enterostomy, or gastric resection, and present themselves with renewed ulceration.

(2) Young or middle-aged men with a long history of peptic ulceration; moderately high acidity, possibly with previous perforation or haemorrhage, unobstructed, and not acutely bleeding, who have been refractory to careful medical therapy, and who have had severe ulcer pain in times of stress which can be relieved only transiently by the usual antacid, milk, or food.

Cases of peptic ulcer selected for section of the vagus nerves should be thoroughly examined in order to rule out any possibility of carcinoma. Their ulcer symptoms should be intractable to good conservative medical therapy. An attempt should be made medically to reduce or eliminate pyloric obstruction pre-operatively. If this cannot be done, then Gastric-resection or Gastro-enterostomy would seem a more feasible operation. Vagotomy combined with Gastro-enterostomy has been recommended for these cases. In conclusion let us realize that it is too early to give a final opinion on the efficiency of Vagotomy. Ten years from now we may have sufficient data on which to base our opinion. Nevertheless it seems at this stage to offer an additional efficient method of treating peptic ulcer cases intractable to adequate medical therapy.

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## OBSTETRICS

### The Indications and Value of X-ray Examination in Obstetrics

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Pregnancy and parturition are fundamentally normal physiological processes and as such should present no cause for concern. However, when anatomical variations or pathological changes are associated, difficulties may be encountered. It is under such circumstances that x-ray examination will frequently reveal information which may be of great assistance in the diagnosis, treatment and prognosis.

Information may also be obtained in regard to the diagnosis of pregnancy and in distinguishing between pregnancy and certain abdominal or pelvic tumors. The anatomical features of the maternal pelvis are sharply defined and diameters can be accurately measured. The foetus is clearly outlined and much can be learned in regard to the position and presentation, the duration of pregnancy and the size of the foetal head in relation to the maternal pelvis. A dead or otherwise abnormal foetus can usually be recognized and valuable assistance can be given in most cases of ante-partum bleeding where a placenta praevia is suspected. Some of the more pertinent aspects of this subject will be discussed in greater detail.

#### Radiological Diagnosis of Pregnancy

X-ray examination cannot be considered a method of early diagnosis as it is not likely to visualize the foetus in a pregnancy of less than sixteen to twenty weeks and a most careful technique must be employed to detect it in its early stages of visibility. A P.A. projection of the pelvis with the tube angled slightly cephalad is used. The rectum must be empty. The diagnosis is then based on the annular contour of the skull, the beaded appearance of the spine, the ladder-like outline of the ribs and the linear shadows of the limbs. This method of diagnosis may be indicated in order to prove an extra-marital pregnancy for medico-legal purposes or when for any reason, other methods of examination cannot be used. X-ray examination at twenty weeks should confirm a suspected pregnancy or exclude the possibility in the presence of a pelvic tumor which simulates a pregnant uterus.

#### Examination of Maternal Pelvic Bones

Radiological examination is indicated when the clinician suspects that delivery may be prejudiced by some abnormality in the anatomical structure

of the maternal pelvis. Such suspicion will be under the following circumstances.

1. There is a history of difficulty in an earlier pregnancy.
2. The external pelvic measurements are abnormal or altered.
  - a. Intercristal diameter is under 26 cm.
  - b. Interspinous diameter is under 24 cm.
  - c. The intercristal diameter is less than 25 cm. longer than the interspinous diameter.
  - d. The external conjugate is under 19 cm.
  - e. The subpubic angle is narrow.
3. There is gross skeletal deformity.

The examination consists of taking A.P. and lateral views of the pelvis and abdomen. In addition, actual measurements of the diameters of the pelvis are made by one of several methods which make corrections for the distortions produced by the divergence of the rays. The method devised by Thoms is most widely used as it is relatively simple and requires very little additional equipment.

Broadly speaking there are four main types.

1. The Gynecoid Pelvis. The inlet is circular and measures about 11 cm. in the A.P. direction and 12.5 cm. transversely. The transverse diameter of the outlet is about 10 cm. and the sacro-spinous notch is wide. No difficulties should be anticipated.

2. The Android Pelvis. The inlet is triangular. A narrow sub-pubic angle is the most important external sign. It is almost always associated with a prolonged, difficult labour or arrest.

3. The Anthropoid Pelvis. The inlet is oval and narrow but of large dimensions. The sub-pubic angle is narrow. Persistent occiput positions are the major complication but in most positions delivery is generally uneventful.

4. The Platypelloid or Flat Pelvis. The diameter of the inlet is under 10 cm. and difficult labour or arrest is likely to occur.

In addition, other congenital or acquired deformities may be demonstrated and each case must be evaluated individually.

#### Prognosis for Parturition

Although pelvimetry as outlined above has considerable value in determining the prognosis for parturition it is not the only information available. The routine A.P. and lateral views usually provide a clear view of the foetal head and an estimate of its size at term in relation to the maternal pelvis can be made. In other words the old maxim that the "foetal head is the best pelvimeter" can be applied to obstetrical radiology.

However, in spite of the refinements in pelvimetry, opinion based on estimated relative proportions of foetal head and maternal pelvis will not always be correct because of other factors. Of those which cannot be anticipated, the degree of moulding which the foetal head will undergo and the strength of the uterine contractions are perhaps the most important. For this reason a "test of labour" often precedes intervention in borderline cases.

### Examination of the Foetus

Clinical uncertainty as to the age or maturity of the foetus is not uncommon and x-ray examination is of value in such cases. This information may be of use in the following circumstances.

1. When the last normal menstrual period is not known.
2. If conception should occur during a period of amenorrhoea as in lactation.
3. When there is a discrepancy between the size of the uterus and the clinical estimate of the duration of pregnancy.
4. Should premature induction be necessary.

With experience one can generally estimate the approximate age of the foetus by appearance alone but the demonstration of certain centres of ossification is of value.

1. Os calcis ..... appears at 21-29 weeks
2. Talus ..... appears at 24-32 weeks
3. Cuboid ..... appears at 40 weeks
4. Distal femoral ..... appears at 35-40 weeks
5. Proximal tibial ..... appears at 35-40 weeks

Post-maturity is diagnosed by the well developed appearance of the foetal bones.

Should tenseness of the abdominal wall or obesity prevent satisfactory palpation or if for any other reason there is some doubt about position, x-ray examination is indicated. It also is indicated when an abnormal presentation, for example, a breech is suspected, in order to determine the position of the arms and legs which have an important bearing both on management and delivery.

Unusual enlargement of the uterus is an indication for x-ray examination as it may be due to multiple pregnancy and information in regard to this is determined readily. In other instances hydramnios is the cause of the enlargement and a careful examination for foetal abnormalities must be done.

The following foetal abnormalities are usually evident:

1. Hydrocephalus. Minor degrees may not be detected but any gross change should be seen.

Distortion due to faulty technique may result in an apparent enlargement of the foetal head and great care must be taken to eliminate this possibility. In post-maturity, the bones are more completely developed and relative proportion to the body is not altered.

2. Anencephaly. This condition which is frequently mistaken for a breech presentation clinically, can be diagnosed with certainty.

3. Spina Bifida. This should be suspected when there is any alteration in the normal contour of the spine.

4. Meningocele. Frequently present in association with spina bifida or with alteration in contour of the occipital bone.

5. Inencephaly and Thyroid Tumors. Both cause hyperextension of the neck but with the former there is an abnormality of the occiput or the cervical spine.

6. Intra-uterine Death. This is usually diagnosed by over-riding of the bones of the skull (Spalding's sign) before labour has begun. This generally takes place four to seven days after death.

Most other signs such as decalcification of the bones, formation of gas in the foetal soft tissues and collapse of the thorax occur after a longer interval.

### Examination in Ante-partum Bleeding in the Third Trimester

Bleeding in the late months of pregnancy may be due to a placenta praevia and x-ray examination is frequently indicated.

Normally the placenta is attached to the fundus or upper uterine wall and when in this position it can be demonstrated on films made to show soft tissue detail. Occasionally it may also be seen at a lower level but when not found in either position it is usually considered to be partly or completely over the internal os where it cannot be so clearly defined.

Examination after injection of the urinary bladder with opaque fluid (50 c.c. of 12½% sodium iodide) will, in the presence of placenta praevia, show an increase in the distance between this organ and the foetal head. This method is only applicable in a vertex presentation and in the last few weeks of pregnancy.

There is no danger to the foetus from the routine exposures to x-ray but a month should elapse before the complete examination is repeated.

# CARDIOLOGY

Edited by J. M. McEachern, M.D. and R. E. Beamish, M.D.

## Abstract

### Physical Findings in Various Cardiac Conditions

#### I. The Differential Diagnosis of Aortic Stenosis, Pulmonary Stenosis, Patent Ductus Arteriosus and Coarctation of the Aorta.

Amer. Prac. 1:247-250 (January) 1947. William J. Kerr, San Francisco.

Clinical diagnosis in these conditions can be made on the basis of knowledge of the dynamics of the circulation and the proper use of the classical methods of physical examination. Correct interpretation of findings is predicated on recognition of the fact that murmurs and thrills produced by turbulence in the blood travel on the pulse wave, and not as sound, from their point of origin. They may, however, travel for short distances backward from their source.

(a) Aortic Stenosis. Inspection may show variable pallor of the patient and displacement of the apex beat downward and outward. Palpation may reveal a plateau pulse if the usual accompanying aortic insufficiency is absent, and a thrill may be felt over the aortic valve and extending into the neck along the course of the great vessels. This thrill coincides with the apex impulse over the base of the aorta but distal to this area it appears later than the apex beat because it travels on the pulse wave. When the degree of stenosis is very marked the turbulence may be insufficient to produce a perceptible thrill or murmur. Percussion demonstrates enlargement of the heart to the left. Auscultation shows a rough systolic aortic murmur which like the thrill is progressively remote in time at sites distal to its point of origin. This murmur may be heard at the apex as a delayed systolic murmur due to propagation backwards from the aortic region.

(b) Pulmonary Stenosis. The same principles apply here. This lesion, however, is usually accompanied by other congenital anomalies. Inspection generally shows varying degrees of cyanosis and clubbing. On palpation there is a rough thrill over the upper part of the chest, most marked on the left, but also felt in a semicircular area centering at the second right intercostal space adjacent to the sternum. This thrill is not propagated beyond the chest but as in the case of the murmur of aortic stenosis, its time of appearance is delayed at points distal to its site of origin.

(c) Patent Ductus Arteriosus. Inspection may show marked arterial pulsations at the base of the neck and abnormal pulsations over the upper part of the left chest. If there are associated lesions,

cyanosis and clubbing may be present. On palpation there is usually a marked rough thrill over the second and third left intercostal space near the sternum. This thrill occurs at least one-tenth of a second after the apex impulse. Percussion may reveal dullness in the region of the pulmonary cone and enlargement of the heart both to the left and right. Pathognomonic finding on auscultation consists of a continuous machinery-like murmur with the accentuated part occurring about one-tenth of a second after the apex beat and the first sound at the apex.

(d) Coarctation of the Aorta. Inspection generally reveals marked pulsations in the carotid arteries and sometimes in the innominate and subclavian artery or arteries. Arteries surrounding the scapulae and occasionally the intercostal arteries may be observed to pulsate, but are not readily identified by palpation. By the latter method it may be noted that the pulse is of a bounding type, whereas pulsations in the abdominal aorta and femoral arteries are diminished or absent. Blood pressure in the arm is abnormally high while in the legs it is normally low. The appearance of femoral pulsations is greatly delayed when compared with the radial pulse or the apex beat and the left radial pulse may be of reduced volume. A thrill may be felt over the left upper thorax or in the region of the left clavicle and, if found, it coincides in time with the murmur. Percussion may show enlargement of the heart to the left. On auscultation the murmur is heard chiefly over the upper dorsal chest particularly over and between the first and second thoracic vertebrae. Although called systolic this murmur occurs about one-fifteenth of a second after systole since it arises at the point of constriction of the descending part of the thoracic aorta, and thus it is not produced until the pulse wave originating at the left ventricle reaches the point of narrowing.

#### II. Salient Features of the Diagnosis of Chronic Rheumatic Valvular Heart Disease

Illustrative Cases. Amer. Prac. 1:101-114 (October) 1946. D. W. Chapman and J. A. Greene, Houston, Texas.

Diagnosis of chronic valvular heart disease of rheumatic origin is not difficult in well-established cases with a typical history of rheumatic fever with the typical manifestations of valvular involvement. There are many cases, however, in which the history is doubtful and the findings atypical. The authors emphasize that in such cases correct evaluation of the condition depends



fundamentally upon a careful history and a thorough physical examination. Laboratory data may be helpful but not conclusive.

In discussing the history of rheumatic fever the authors quote Martin to the effect that "the disease is insidious in onset, protean in its manifestations, pleomorphic in its behavior, unpredictable in its course and shows a great tendency to be polycyclic." Arthritic symptoms vary from the typical migratory polyarthritis of the larger joints to mild pain and slight stiffness in one joint or to vague "growing pains." In many instances of chronic valvular disease of rheumatic origin, no history of rheumatic fever is discoverable. It is suggested that mild choreiform symptoms, periods of unexplained fever, episodes of atypical abdominal pain and recurrent upper respiratory infections are the easily overlooked or forgotten forerunners of the carditis in such cases.

Physical signs in mitral stenosis are discussed at some length. The presystolic murmur is diagnostic when present, but in some instances it is found only after careful search with the patient leaning forward in deep expiration, or with the patient lying prone or in the left lateral position. There is usually an accompanying systolic murmur due to mitral regurgitation. The brachial pulse is of small volume but practically normal contour. This is a consequence of the diminished volume output by the left ventricle due to interference with its filling caused by the stenosed mitral valve. This latter also results in stasis in the pulmonary circulation with hypertrophy and dilatation of the right ventricle (best demonstrated with the patient in a sitting position) and accentuation of the second sound in the pulmonary area. Enlargement of the right ventricle, which occupies the anterior two-thirds of the precordium, causes a diffuse heaving apex beat which can be both seen and felt. Depression of the diaphragm by this hypertrophied right ventricle interferes with the normal balance between the actions of the diaphragm and the intercostal muscles. Normally the medial costal margins move laterally and anteriorly because the intercostal muscles have a mechanical advantage over the diaphragm. When the latter is depressed, however, it has a more direct line of traction along the costal margin and counteracts or overcomes the advantage of the intercostals with the result that excursion of both medial costal margins during inspiration is decreased. In extreme cases the costal margins may move medially and slightly posteriorly.

In aortic regurgitation findings consist of a large pulse with celer contour, diminished movement of the left medial costal margin, overaccessible left ventricle, and an early blowing diastolic murmur over the aortic area and along the left

border of the sternum. Other peripheral signs such as the "pistol shot" over the femoral arteries, Duroziez's phenomena and capillary pulsation may be present. A wide pulse pressure with a lowering of the diastolic pressure is usually found.

Aortic stenosis produces a small pulse of plateau contour, a palpable thrill over the carotid artery and a systolic murmur over the aortic area which is usually transmitted into the vessels of the neck. In addition there are the signs of left ventricular hypertrophy.

The X-ray and electrocardiogram in each of these conditions is described. It is stressed that their evidence is confirmatory but not conclusive. Three illustrative cases are appended.

**III. Coarctation of the Aorta.** A Review of 104 Autopsied Cases of the "Adult Type," 2 Years of Age or Older. *Am. Heart J.* 33:146-168 (February) 1947. G. H. Reifens-stein, Syracuse, N.Y., and S. A. Levine and R. E. Gross, Boston.

Possible surgical treatment of coarctation of the aorta stimulated the authors to review cases of this condition reported since Abbott's analysis of 200 cases in 1928. Two groups of cases occur: (1) Those in which coarctation is accompanied by major congenital cardiac abnormalities so that the infant survives only for a few days or weeks ("infantile type") and (2) those in which coarctation is the major or sole anomaly and the patient survives for a number of years ("adult type"). One hundred and four autopsied cases of the latter type occurring in subjects over the age of two years are analyzed.

This uncommon lesion is encountered but once in 3000-4000 autopsies. It occurs four to five times more often in males. In this series the average age at death was 35.0 years and 61% of patients died before or during the fortieth year of life. Seventy-four per cent of patients died as a result of: rupture of the aorta (23%), bacterial endocarditis or aortitis (22%), congestive failure (18%), or an intracranial lesion (11%). The remaining 26% died of causes which may be considered "incidental." The commonest intracranial lesion was rupture of an associated congenital arterial aneurysm.

The cardinal clinical features of the condition are described as follows: (1) a systolic murmur of moderate intensity is present over the upper precordium and in the left interscapular region and is generally almost as loud in the back as anteriorly, (2) hypertension of the upper extremities (frequently not marked), (3) lower blood pressure of the legs (such as absent femoral pulses), (4) collateral arterial anastomoses (with rib erosion by X-ray), and (5) signs of cardiac hypertrophy.

The authors conclude that diagnosis should be made as early as possible as surgical cure would likely be more feasible if done before the aortic wall has become thinned and dilated. The associated hypertension has been treated by sympathectomy in a few patients.

#### Comment

Early recognition of the exact nature of cardiac lesions has become more important than ever before due to the development of new medical and surgical therapies in recent years. There is considerable evidence to suggest that patients with known rheumatic heart disease who are subject to recurring upper respiratory infections are benefited by prophylactic administration of sulphonamides. Patients so treated must be closely watched for clinical or laboratory evidence of toxicity. In patients with rheumatic or congenital heart disease

sulphonamides or penicillin should be given before operative procedures such as tonsillectomy, tooth extraction in an effort to prevent subacute bacterial endocarditis. In patients with patent ductus arteriosus, coarctation of the aorta, and pulmonary stenosis (usually Tetralogy of Fallot) the possibility of surgical treatment must always be seriously considered.

In an age when technical diagnostic procedures have achieved great prominence it is refreshing to read papers such as the first two reviewed above in which the emphasis is placed on the superior value of the clinical examination in cardiac diagnosis. They are still the most informative and most readily available methods. It is true, however, that in certain congenital lesions skilful fluoroscopy and even heart catheterization may be required.

## PAEDIATRICS

Edited by J. Graf, M.D.

### Ovarian Tumor in Childhood Report of a Case

Q. D. Jacks

This is the history of a French-Canadian girl of eleven years. When first seen Jan. 10, 1947, at the Misericordia Hospital in Winnipeg, she seemed in perfect health other than having the appearance of a woman at full term of pregnancy.

**History of Present Illness:** The patient has noticed a gradual increase in the size of her abdomen during the past year. It seemed to decrease in the summer but has steadily increased during the last four or five months and during this time the patient has had three or four bowel movements daily.

**Past and Family History:** Essentially negative.

**Functional and Systemic Enquiry:** Essentially normal.

**Physical Examination:** Weight, 88 lbs.

**Skin:** Bi-lateral cubical psoriasis of the upper extremities.

**Abdomen:** Markedly protuberant — Symmetrically distended, the skin taut and the veins prominent. No caput medusa. Dull on percussion throughout. On palpation there is essentially one large midline mass extending from the symphysis pubis to the xyphisternum with several firm nodules extending into the flanks.

**Laboratory findings** were of no value in the diagnosis. The urine repeatedly showed four plus albumen but no casts or blood corpuscles.

**X-ray:** Flat, A.P. and Lateral films of the abdomen: "There appears to be marked distention of the abdomen. There are areas of calcification

scattered throughout the abdomen. This is probably a dermoid cyst."

(Signed) H. Morris

At operation on January 13, 1947, a large ovarian tumor was removed with partial removal of smaller secondary friable implants from the floor of the pelvis under the recto-sigmoid. The capsule of the large tumor had ruptured. Very little free abdominal fluid was present. Her immediate post-operative recovery was uneven.

#### Pathologist's Report, Dr. O. C. Trainor

A roughly elliptical solid tumor 10 inches by 6 inches, weighing 15½ pounds. The exterior surface presents an irregular coarsely lobulated appearance. Cross section shows a tough fibrous capsule approximately 1 mm. in thickness. The surface is greyish in color and shows numerous scattered small cysts filled with a gelatinous material. The surface is coarsely and irregularly lobulated and presents a variegated appearance. There are scattered areas of calcification giving a grating effect on sectioning.

The microscopic picture is extremely variegated. Elements from each of the embryonic layers are clearly recognizable some showing good differentiation, while others reveal evidence of malignant transformation. There is no definite organoid formation. Among the tissues recognized were epidermic structures including hair follicles and sebaceous glands and small epidermic cysts. There were areas of intestinal mucosa showing carcinomatous change and fairly well differentiated salivary gland, pancreas and fallopian tube. Mesodermic elements were especially prominent.

making up the bulk of the tumor and consisting principally of connective tissue with areas of smooth muscle and cartilage.

**Diagnosis:** Embryonal Teratoma.

## Abstract

**The Influence of Sulfanilamide Therapy Upon the Course of Acute Glomerulonephritis in Children.** Milton Rapoport. Mitchell I. Rubin and Arthur D. Waltz, Philadelphia, Pennsylvania, Department of Pediatrics, School of Medicine, University of Pennsylvania, and the Children's Hospital of Philadelphia. *Am. J. of the Med. Sciences.* Vol. 211; 307-311. March, 1946.

This is a report on 33 cases of acute glomerulonephritis treated with sulfanilamide and 40 cases of the same disease from whom sulfanilamide was withheld.

It has been established by Lohlein in 1907 and reaffirmed by Longcope that streptococcal infections precede acute glomerulonephritis with great frequency.

The study was started in 1938 and sulfanilamide was the drug chosen because it is highly effective against beta hemolytic streptococci. When the newer sulfonamides came into use, sulfanilamide was not abandoned in the study as it causes less ematuria and crystalluria than the others. In addition, this drug is low in renal toxicity.

In assessing recovery from the disease in children, the urinalysis, Addis urinary sediment counts, and sedimentation rate were used. Using the Addis count the excretion of red cells is the last to return to normal in recovery. The sedimentation rate of the red cells parallels the Addis count.

The functional status of the kidney was assessed by the urea clearance test phenolsulfonphthalein excretion test. The return of the blood pressure to normal was an indication of recession of vascular spasm. Frequently X-ray, E.K.G. and clinical studies were done on the heart as a guide to the status of that organ.

The two groups were comparable; the average age was 6+3 years and the average duration of disease when diagnosed was about 8 days. There was a preponderance of males—57%. 30% of the patients had cardiac involvement on admission and 60% had hypertension. The treatment of both groups was the same except for the use of sulfanilamide in one group.

Cultures of the nasopharynx were done and predominant-organisms were recorded. In 60% of the cases the beta hemolytic streptococcus was the main organism. The likelihood is that this organism was present in a higher percentage and may have been identified had repeated cultures or antistreptolysin titres been done.

The dose of sulfanilamide given was 1 grain per pound per day for 5 days and then half this dose for 15 days. Following this, 10-20 grains a day was given for 2-6 weeks. Sulfanilamide was given from 34-62 days. The levels of sulfa in the blood in 19 patients varied from 4-16 mgms.

Cyanosis and a drop in Haemoglobin were noted but the drug was not discontinued, even though transfusions were necessary in some cases. No leukopenias were encountered. One child had a severe drug eruption.

As a result of the therapy the original infections were controlled by the drug. The urinalysis returned to normal at the same time in both groups, in 37 days. The Addis count returned to normal slightly earlier in the sulfa-treated group, in from 86-120 days. The sedimentation rate was normal in both groups at about the same time, about 80 days. The authors conclude that sulfa had no influence on the course of the process in the kidney. Recovery occurred in all cases studied.

The time required for urea clearance rate, blood pressure, and heart signs to return to normal was the same in both groups.

The authors conclude that sulfanilamide is without influence on the course and duration of acute glomerulonephritis in childhood. 7 References. 4 Tables.

## Editor's Note

The Addis count and sedimentation rate have not succeeded to popularity, locally, in the following of cases of acute glomerulonephritis in childhood. These tests are best guides for recovery in this disease.

Sydney Israels.

## Book Review

Continued from Page 216

before, during and after operation, the choice of anaesthetic, the possible complications, their recognition and other important matters are discussed.

*Diabetes in Children, and Pregnancy and Diabetes* are the titles of two chapters which consider all the significant details of care and treatment. There are other chapters on hyperthyroidism, bronze diabetes, obesity, hyperinsulinism and other topics.

In the chapter devoted to diet, instructions are given in the formulation of menus. There are many charts and tables, a number of menus and several pages of recipes.

John is not always in complete agreement with other authorities but he gives reasons for all his procedures and speaks out of a very great experience. He writes clearly and forcefully. His instruction is logical and easy to follow.

"*Diabetes*," by Henry J. John, M.A., M.D., F.A.C.P., Lt.-Col., M.C., Cleveland, Ohio. Illustrated—300 pages—Price \$3.75. C. V. Mosby Company, St. Louis, Mo., 1946. Canadian Agents, McAinsh and Co. Limited, Toronto, Ontario.



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# TUBERCULOSIS

Edited by K. C. Johnston, M.D.

## Laryngeal Tuberculosis

### Incidence

Tuberculous laryngitis is a common complication of active pulmonary tuberculosis. Reports in the literature show a surprising variation in the incidence—from 3% to 97.4%. The disparity of these figures is due almost entirely to the difference in extent of the pulmonary disease in those cases which were examined. The more advanced pulmonary disease will show a greater incidence of laryngeal tuberculosis. In the two years, 1945 and 1946, there were 395 cases of pulmonary tuberculosis discharged from St. Boniface Sanatorium. Eighty were classified as minimal, and in these no laryngeal changes were noted. One hundred and twenty-three were moderately advanced with the larynx involved in 8 cases—6.5%. The remainder, 192 patients, had far advanced disease and 35 had tuberculous laryngitis—an incidence of 18.2%. The average incidence for all cases is 10.8%. This figure conforms closely to those which have been reported from other institutions admitting patients indiscriminately from the general population.

### Occurrence

Laryngeal tuberculosis is comparatively rare in infancy and early childhood—gradually increasing through adolescence to reach a maximum between the ages of 20 and 40. It diminishes in later years and is rare in old people. It is seen more often in males than in females. Previous laryngeal infection or trauma do not appear to be predisposing factors.

### Pathology

The laryngeal lesions may be extremely varied in type and location. They may be infiltrative, proliferative, or destructive. The most common sites of initial involvement are the arytenoids, the interarytenoid space, the vocal cords at the junction of cord and vocal process, the ventricular bands, the epiglottis, and the aryepiglottic folds.

The earliest changes are usually infiltrative—either cellular or edematous. With the former the inflammation may be localized, involving a comparatively small area; e.g. one or both arytenoids, the interarytenoid space or a portion of one cord. Occasionally, in acute disease, the entire larynx is affected by these inflammatory changes. Healing may occur in the infiltrative lesion with complete absorption of the tuberculous elements, leaving only a small fibrosed area of little or no significance. If the disease progresses, a super-

ficial slough will leave an area of ulceration which may increase with time to include the entire larynx and the epiglottis.

The progress of the disease may be manifested more markedly by proliferation than by ulceration. Granulations form at the site of the original lesion particularly where loose tissue is involved. They may be fine or coarse, diffuse or grouped together to form a tuberculoma. The activity in the larynx may subside with the control of the pulmonary lesion and healing by scar formation and contraction will begin. The resulting disability will depend on the extent of the lesion and particularly the damage around the aperture.

Occasionally, the first changes noted will be edematous infiltration which is probably more allergic than inflammatory in nature. The fluid causes swelling of the loose tissue. The swollen areas are dull gray in color. The arytenoids, aryepiglottic folds, epiglottis, and ventricular bands are the common structures affected. If the response is acute, all may be seen to be involved at the first examination. Subsequent observation may reveal extensive and rapidly progressive ulceration. In less acute cases where the pulmonary tuberculosis is controlled, slight edema will absorb completely leaving no visible trace. Perichondritis and chondritis can develop from any type of lesion. The arytenoid and the epiglottis are the most commonly involved; the thyroid and the cricoid less frequently.

### Pathogenesis

The larynx may be infected either from direct contact with positive sputum or from the blood stream and lymph channels. Some pathologists favor the former—others favor the latter. The positive sputum theory appears to be upheld by the observation that laryngeal infection is more common in far advanced and particularly in bilateral pulmonary disease. The arytenoids and the posterior commissure, so frequently involved, are almost constantly bathed in tuberculous pus in those cases where there is marked production of sputum.

On the other hand, biopsy will occasionally prove a tuberculous lesion on the cords or over the cartilages when no pulmonary disease can be demonstrated in the X-ray. Granulations and ulceration may be first noticed in areas where contact with sputum is slight. An interruption of the mucous membrane might be a contributing factor in those cases but it has been definitely shown that tubercle bacilli can penetrate the intact mucosa. Without some credence of the

theory of blood stream infection, it is difficult to explain why patients with minimal disease occasionally develop tuberculosis of the larynx, whereas some, with far advanced active pulmonary lesions and consistently positive sputum, show no laryngeal changes.

### Lesions

In acute laryngeal disease the mucous membrane over one or both arytenoids may be swollen and will vary in color from red to dull gray depending on the proportion of cellular to edematous infiltration. The aryepiglottic folds are frequently involved as the process extends, and eventually the epiglottis may be included. The soft tissue of the edges and the anterior surface will have the same appearance as the arytenoids. More frequently the reaction is less acute. Small granulations are commonly seen in the interarytenoid space and may increase in size to the point where one to three small granulomas are seen jutting into the aperture between the cords. The lesion may extend forward along the vocal processes and from thence to the surface of the vocal cords. Rarely will the granulations form a tuberculoma which blocks the aperture completely. Isolated areas of granulation tissue will occasionally be seen on the cords themselves.

The ulcerative lesions most commonly appear on the medial aspect of the vocal process. The lesions extend forward along the cord—giving it a saw-tooth appearance. The ulceration may extend over the remainder of the medial aspect of the arytenoid and into the interarytenoid space. Individual ulcers of the epiglottis are uncommon in the absence of other laryngeal disease. When these do occur they are found along the edge or on the posterior surface. Extension of ulceration may spread rapidly and in some cases will result in complete erosion of the epiglottis. The ulcerative lesions are most often responsible for infection of the laryngeal cartilages.

### Symptoms

Because of the frequency of lesions in the posterior commissure, the arytenoids and the cords, the most common symptom is hoarseness. Depending on the extent and the site of the disease the hoarseness will vary from slight huskiness to complete aphonia. In the early stages the patient does not complain of pain but notices dryness and a covered voice, particularly in the morning. Pain may be the first symptom with or without hoarseness or may follow the period in which dryness was a prominent feature. Dyspnoea is extremely rare. Dysphagia is usually not marked unless there is gross swelling of the arytenoids, extension to deep structures or involvement of the epiglottis. In many cases there are no symptoms until the disease is far advanced.

### Diagnosis

Due consideration and evaluation of symptoms and thorough mirror examination of the larynx will usually suffice to make a positive diagnosis. The lesions in most cases are characteristic in the situation and type. Roentgen film of the chest should be taken and sputum examined for tubercle bacilli. Direct examination of the larynx should be avoided where active tuberculous lesions are present. If the pulmonary lesion is slight and negligible and there is reasonable doubt as to the positive diagnosis; e.g. an isolated granuloma, a careful biopsy is permissible. Removal of a portion of the tuberculous ulcerative lesion usually results in an increase in extent and activity of the disease. In the very early cases where hyperemia is the only finding, frequent subsequent laryngeal examinations will usually confirm or deny the presence of active tuberculosis.

The differential diagnosis includes chronic specific laryngitis, syphilis, and carcinoma. The lesions of tuberculosis are so characteristic that there is rarely any difficulty. When doubt exists the deciding factors will be the chest examination, serology, sputum examination, and finally, biopsy.

### Prognosis

Healing can take place in all forms of laryngeal disease and the final outcome of the laryngeal lesion depends on the progress of the pulmonary disease. Lesions of the epiglottis usually carry a serious prognosis. Rapidly increasing tuberculosis of the larynx usually implies lack of resistance and a fatal termination. If healing occurs, the residual disability is contingent upon the extent to which the disease progressed and what areas were affected. Frequently there is incomplete closure of the larynx from cord erosion or piling-up in the post-commissure and the patient will be permanently hoarse. A husky voice is a characteristic of those who have been "on the cure."

### Treatment

Control of the pulmonary lesion is the prerequisite in treating laryngeal tuberculosis. Treatment includes general rest and collapse therapy. The treatment of the larynx should be directed toward the relief of dryness, pain, or dysphagia, and the healing of the lesion. The former purpose can be achieved by the well-advised use of oil spray or an anaesthetic spray—commonly 1/4 of 1% cocaine. The oil spray may be used as necessary and the cocaine spray a few minutes before treatment. The severe pain arising from necrosis of the structures—(often referred to the ear on the responding side)—may be relieved by alcohol injection or section of the superior laryngeal nerve.



The principle factor which promotes healing is vocal rest. For the moderately extensive lesion whispering should be advised, with a word of caution against forced whispering. The speaking voice should be used for 50 to 100 words daily to maintain muscle tone in those patients who may be on whispering technique several months. For the far advanced lesion silence may be necessary and a pad and pencil should be the means of communication. Local applications of silver nitrate, iodine, etc., are rarely beneficial. Electrocautery puncture of edematous areas is useful in selected cases. The puncture reduces the intense swelling, relieves the pain and promotes fibrosis. Excessive granulation tissue may be touched with the hot cautery to expedite healing or to remove obstruction.

Streptomycin inhalation therapy is at present on trial and some workers have submitted promising reports. It will be difficult to assess the exact value of any local treatment since the main conditioning factor of the laryngeal lesion will usually be the state of the pulmonary disease.

### Summary

Laryngeal tuberculosis is a common finding in patients with moderately or far advanced active pulmonary tuberculosis. It should be suspected in every case of active disease in the lungs—particularly when dry throat and hoarseness are present. The lesion is characteristic. Mirror examination of the larynx will usually suffice to confirm or deny the diagnosis. All laryngeal structures must be well visualized. The most common site of early infection is in the mucous membrane over the arytenoid cartilages and the interarytenoid space. Healing by fibrous tissue formation is the rule and disability depends on the extent of the disease and the structures involved. Laryngeal symptoms are often among the first complaints of a patient with pulmonary tuberculosis. It is therefore extremely important that any person who has a lesion tentatively diagnosed as chronic laryngitis, papilloma, or unexplained paralysis should have a Roentgen film of the chest.

Treatment must be directed first towards the pulmonary disease. The larynx will usually improve when the tuberculosis in the lungs is

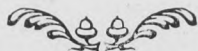
controlled. Local treatment includes vocal rest, electrocautery puncture in severe edema, and electrocoagulation of extensive granulomas. Chemotherapy and local applications are disappointing with the possible exception of streptomycin inhalation. Concerning the latter, further investigation and proper evaluation of results are necessary before the final benefits can be fully assessed.



## Tuberculosis of Nasopharynx

Tuberculosis of the nasopharynx occurred in 18 of 24 cases of pulmonary tuberculosis studied at autopsy. The pathological process was generally an ulcerative lesion on the posterior portion of the roof and the upper portion of the posterior wall. Less frequently lesions were found on the posterior margin of the ostia of the Eustachian tubes and nasopharyngeal surfaces of the uvula and soft palate. In 4 of the 18 cases lesions were found only microscopically. Graf noted gross lesions in 36% of 118 cases of pulmonary tuberculosis, while microscopically the incidence was 82%. No nasopharyngeal tuberculosis was found either by gross or microscopic examination in the authors' cases of miliary tuberculosis. They agree with Dietrich that hematogenous infection is rare. The important etiological factor is the inoculation of the nasopharyngeal mucous membrane by the bacilli from the sputum. This explains the localization. The deep inferior cervical lymph nodes were involved, but not the superior cervical retropharyngeal nodes. Gross ulcers were irregular, ovoid, with undermined margins and yellowish-gray bases. Histopathological changes were observed primarily in the remnants of the lymphatic tissue and consisted of subepithelial tubercles with varying degrees of caseation. Clinically, tuberculosis of the nasopharynx may remain as the active source of reinfection after the arrest of the pulmonary process. Therefore, where sputum conversion does not occur, the nasopharynx should be investigated as a possible focus.

Tuberculosis of the Nasopharynx: Its Frequent Incidence and Clinical Significance, A. R. Hollender & P. Szanto, *Dis. of Chest*, May-June, 1945, 11: 227.—(K. R. Boucot).  
Taken from "The American Review of Tuberculosis Abstracts," Oct.-Nov., 1946.



## Hospital Clinical Reports

### Winnipeg General Hospital

Reported by J. W. Whiteford, M.D.

### Post-Tonsillectomy Lung Abscess

Dr. M. B. Perrin and Dr. D. Nicholson

In April, 1946, a girl of 8 years was admitted to the Winnipeg General Hospital for tonsillectomy. On April 13th, after returning home, pain in the left axilla was noted accompanied by a non-productive cough. On April 20th she was admitted to hospital, where sulfa and penicillin therapy were begun. At this time her cough was productive and temperature hectic.

May 3, 1946: Pain in the right axilla was still present, with repeated episodes of cough producing foul sputum. This was again controlled by penicillin and sulfa.

May 20, 1946: X-ray of the chest showed an abscess cavity of the right apex.

August, 1946: X-ray showed extending involvement of right upper lobe.

October 17, 1946: X-ray showed cavitation in both upper and lower lobes on the right side.

At this time there was a daily elevation of temperature and clubbing of the fingers was marked. She was assessed as to the type of treatment which should be used; it was felt that drainage of the effected lung was out of the question and that pneumonectomy was the only treatment which would give a chance of survival. In October, 1946, a right pneumonectomy revealed that the whole of the right lung was involved with multiple vascular adhesions over the entire pleural surface. The patient died at operation.

Abscesses of the lung may be divided into (1) post-pneumonic and (2) putrid abscesses. This last group result from infection of pulmonary radicles with a mixture of aerobic and anaerobic organisms, leading to formation of pus and gangrene. Of these 40 to 50% follow operations on the nose and throat. The predisposing causes are unconsciousness and intoxication.

Treatment consists essentially of permitting air to have access to the site of infection. This can be done by bronchoscopy in the early stages and later on by incision of the chest wall and drainage of the abscess. Abscesses always point at the periphery of the lung, and since there is always an associated pleurisy with adhesions a two-stage operation for drainage is unnecessary. The abscess is opened widely and packed. A broncho-pleural fistula always results but this will usually close. Bronchoscopy is used to produce dilatation and drainage of early lung infections, and granulation

tissue may be cauterized by this route. If bronchoscopy does not produce early improvement, abscess should be opened as soon as localized. If the abscess is of long standing, lobectomy or pneumonectomy, as necessary, is the treatment of choice.

### Post-Mortem Findings

The right pleura showed dense, shaggy adhesions. The right lung was almost completely consolidated with multiple abscesses. Hilar lymph nodes were greatly enlarged. The left bronchus was filled with mucus and the left lung showed early broncho-pneumonia. The microscopic examinations confirmed the gross appearance but the areas showed foamy cells containing fat globules. The pathological diagnosis was as follows:

- (1) Lung abscess.
- (2) Acute bronchiectasis.
- (3) Lipoid pneumonia.

Lipoid pneumonia is most often seen in infants whose swallowing reflex is poorly developed or in nervous disease where the gag reflex is absent. Sources of the lipid material are commonly cod liver oil in children and oil preparations for the treatment of nose and throat disease. It is noted that the poppy seed oil used in lipiodol visualization of the bronchi has no ill effect except where there is partial obstruction.

Dr. Schoemperlen emphasized the danger of oily nose drops and also noted the importance of repeated bronchoscopy and chemotherapy in the early treatment of atelectasis and lung abscess.

Dr. Danzinger: What about establishing routine post-tonsillectomy chest X-rays?

### A Case of Mycosis Fungoides

Dr. Arthur Birt

Dr. Birt presented the history of a woman, 66, who for four years had noticed patches of reddened, scaly skin on thighs, back and shoulders. These were extremely itchy. One year ago one of these patches on the left loin developed into a swelling which subsequently ulcerated. Six months ago a small nodule developed beneath the left arm.

On admission to the Winnipeg General Hospital physical examination was otherwise negative. White blood count was 5,000, with a normal differential; sedimentation rate was normal and Wassermann was negative. Urine was negative.

On February 3, 1947, biopsies were taken from the skin tumor and the swelling in the left arm which proved to be a lymph node. The skin tumor

showed histological evidence of mycosis fungoides, while the lymph node showed lymphosarcoma.

**Dr. Birt:** Mycosis Fungoides is one of a group of cutaneous lymphoblastomata which also includes the cutaneous manifestations of Hodgkin's disease and lymphosarcoma and, second, leukemia cutis. There is a widespread opinion that there is no such entity but that these conditions are merely cutaneous manifestations of lymphoblastoma. The condition known as mycosis fungoides appears first as a chronic dermatitis which is commonly very itchy; it may be eczematous in type or may mimic psoriasis, para psoriasis or exfoliative dermatitis. In the second stage these skin lesions become thickened and raised, and usually present crescentic or serpiginous outline and are commonly bluish red in color. The third stage is that of tumor formation. Tumors usually appear at the site of previous skin lesion but may appear in previously normal skin. The tumor varies in size, often fungating, and is purplish red in color; the surface frequently ulcerates. Prognosis: This condition in its end stage is identical with the end stages of other lymphoblastomata, and at the time this woman was seen the proper diagnosis was that of lymphosarcoma. The average time of survival is five years.

Dr. Penner presented biopsy findings which made the diagnosis of lymphosarcoma.

Dr. Dingle stated that the treatment of choice in these cases is X-ray; the lesions are very radio-sensitive and respond quickly but tend to recur. Dr. Dingle presented color photographs of another case of mycosis fungoides which began X-ray treatment 18 months ago and is at present well, with no evidence of recurrence.

**Dr. J. D. Adamson:** What is the relations of the skin lesions to the lymphoblastoma? Is the presumption that lymphoblastoma is already present when the skin lesions appear?

**Dr. Penner:** There are two schools of thought on the subject.

The suggestion was made that the bone marrow be examined, since differential blood count showed no abnormality.

## An Unusual Gastric Lesion

**Dr. C. W. Burns and Dr. R. A. MacPherson**

Dr. Burns presented the case of a man, aged 81 years, with a history of dyspepsia, vomiting, and the loss of 25 pounds since the summer of 1946. He was admitted to this hospital about January 15th with almost complete pyloric obstruction. X-ray showed a greatly narrowed pylorus and a mass in the stomach which was considered to be typical of malignant tumor. A subtotal gastrectomy was performed and the patient recovered satisfactorily.

Dr. D. W. Penner presented the pathological report: Examination of the stomach showed an intact granular mucosa overlying a submucosal thickening which proved to be a chronic abscess. Smears of the abscess showed Gram positive diplococci. Diagnosis: Localized acute phlegmonous gastritis.

Acute phlegmonous gastritis may be localized or general. Approximately 400 cases have been reported, with a very high mortality. Only one case has been diagnosed before surgery or autopsy. Low gastric acidity is a predisposing cause, and 50% of these patients have previous gastritis. The exciting causes include (1) septic process elsewhere in the body and (2) ulceration of gastric mucosa.

## A Case of Gas in the Tissues Associated With Infection

**Dr. F. G. Allison**

A man of 75 was admitted to the Winnipeg General Hospital on December 31, 1946. Previous illnesses included diabetes, bundle branch block with auricular fibrillation and congestive heart failure, and broncho-pneumonia. Since December 15th he had complained of anorexia, weakness and general aches. On admission the abdomen was negative; temperature was 100. On January 3, 1947, a tender soft swelling was noted in the right loin and iliac fossa; there was subcutaneous emphysema of the right thigh. White blood count was 13,000 with 80% polymorphs. Stool showed no occult blood. X-ray confirmed the presence of gas in this swelling.

Three possible sources of gas in this site were considered:

- (1) Infection by gas forming organism.
- (2) Fistulous connection with bowel lumen.
- (3) Extension of an emphysema from the mediastinum.

On January 4, 1947, aspiration of the mass was done but no fluid or air could be obtained. On January 11, 1947, pus was noted draining from the aspiration wound. X-ray investigation showed no emphysema of the chest or mediastinum and barium enema was negative, although the caecum filled poorly.

**Dr. Alan Klass:** Following the above investigation the patient was examined again and it was noted that on percussion of the mass with the patient in various positions shifting dulness was elicited. Aspiration was repeated and pus was obtained. Following this an incision was made and 25 ounces of pus were evacuated. Organisms found were *B. coli*, *B. aerogenes* and *streptococcus*.



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## Medico-Historical

### Domestic Encounter

(After a number of interesting adventures Hajji Baba finds himself attached to Mirza Ahmak, physician to the Shah. He falls in love with Zeenab, the beautiful curdish slave of the doctor's wife. Circumstances favour the lovers and they enjoy themselves, and a breakfast, in the apartment of the doctor's wife. Zeenab is telling Hajji the story of her life).

Zeenab was proceeding to relate to me how she became the property of Mirza Ahmak, when a loud knocking at the gate of the house was heard. We both got up in great alarm. My fair one entreated me to take my departure by the terrace, while she went to see who it might be. By the voice that was ordering the door to be opened, she recognized the doctor himself; and, trusting to her own ingenuity for giving good reasons for the appearance of breakfast and good cheer which he would perceive, she forthwith unbarred the gate, and admitted him.

From the terrace I could watch all that was going on. The doctor appeared quite delighted to find Zeenab alone, and made her some speeches full of tenderness, that there was no mistaking how his affections were placed. Looking into the window of his wife's apartment, he perceived the remains of the breakfast, and every appearance of the room having been occupied. He was asking some questions concerning what he saw, when in came the khanum herself, followed by her women. She entered the house so unexpectedly that she appeared before them ere they could separate. I shall never forget her look and attitude at this sight.

"Selam aleikum, peace be unto ye," said she, with mock respect; "I am your very humble servant. I hope that the health of both your excellencies is good, and that you have passed your time agreeably. I have arrived too soon, I fear." Then the blood creeping in to her face, she very soon relinquished her raillery, and fell tooth and nail upon the unhappy culprits.

"And breakfast too—and in my room. Marshallah! Marshallah! It is understood, then, that I am become less than a dog; now that in my own house, on my own carpet, on my very pillow, my slaves give up their hearts to joy. La Allah il Allah! There is but one God! I am all astonished! I am fallen from the heavens to the ground!"

Then, addressing herself to her husband, she said—"As for you, Mirza Ahmak, look at me, and tell me by my soul, are you to be counted a

man amongst men? A doctor, too—the Locman of his day—a sage, with that monkey's face, with that goat's beard, with that humped back, to be playing the lover, the swain. Curses attend such a beard!" then, putting up her five fingers to his face, she said, "Poof! I spit on such a face. Who am I, then, that you prefer an unclean slave to me? What have I done, that you should treat me with such indignity? When you had nothing but your prescriptions and your medicines in the world, I came and made a man of you. You are become something, thanks to me! You now stand before a king; men bow the head to you. You wear a Cashmerian shawl; you are become a person of substance. Say, then, oh, you less than man! what is the meaning of all this?"

The doctor, during this attack upon him, was swearing an abundance of oaths, and making ten thousands of exclamations, in proof of his innocence. Nothing, however, could stop the volubility of his wife, or calm her rage. By this time she had worked her passion up to such a pitch, that oath succeeded oath, and blasphemy blasphemy, in one raging, unceasing torrent. From her husband she fell on Zeenab, and from Zeenab she returned again to her husband, until she foamed at the mouth. She was not satisfied with words alone; but, seizing the wretched girl by one of the long tresses which hung down her back, she pulled it till she roared with pain; then, with the assistance of the other slaves, she was thrown into the reservoir, where they beat and soused her until both parties were nearly exhausted. Oh, how I burned to fly to her rescue! My body was become like glowing fire. I could have drunk the blood of the unfeeling wretches. But what could I do? Had I rushed into the harem, death would have been my lot; for most probably they would have impaled me on the spot; and what good would that have done to Zeenab? She would have been even more cruelly treated than before, and the doctor's wife would not have been the less jealous. So, when the storm had subsided, I quietly stepped down from my hiding-place on the terrace, and walked into the open country without the town, to consider upon the course which I ought to pursue. To remain with the doctor was out of the question; and to expect to enjoy Zeenab's company again was folly. My heart bled when I reflected what might be the fate of that poor girl; for I had heard horrid stories of the iniquities performed in harems, and there was no length to which such a demon as the khanum might not go with one so entirely in her power.

Moirier "The Adventures of Hajji Baba"



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I. Kirby, W. M. M.; Leifer, W.; Martin, S. P.; Rammelkamp, C. H., and Kinsman, J. M.: J.A.M.A. 129:940 (Dec. 1) 1945. 2. Romansky, M. J., and Rittman, G. E.: Science 100:196 (Sept. 1) 1944.

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## Editorial

J. C. Hossack, M.D., C.M. (Man.), Editor

### Publicity

Doctors, as I have had occasion to say before, are not the most popular members of the community. As individuals, each has his circle of friends, but the profession has never been well liked. As a result, the laity are willing to believe unpleasant tales, even when these are merely flavoured with truth. They are uncritical when their prejudices are fostered.

From time to time, there appear in the lay press letters and articles which condemn us for imagined sins of commission and omission. One of the most recent of these criticisms appeared recently in an Eastern paper. The criticism was not direct, but was none the less unfavourable. It was the story of a man, now eminent, who, when youth, was threatened with the amputation of a leg. His parents were poor and so they had no recourse save to put him in a "charity ward." According to the sob story, the house doctor decided that the leg should come off and what could the parents do? They were too poor to employ a specialist.

The little boy was very miserable at the thought of going without a leg and so were the parents. Then the miracle happened. An important orthopedist suddenly leapt into the picture and, presto! the limb was saved. The little boy, the story relates, never forgot those unhappy days in the Winnipeg Children's Hospital, and the experience has directed many of his present currents of thought.

That, in essence, is the story. How true is it? When, and where, do house doctors take upon themselves the responsibility of removing little boys' legs or even of deciding that someone else must do it? And what is miraculous about an

orthopedist taking in hand an orthopedic case in a staff ward? And where, here or elsewhere, can one get better care than in the "charity ward?" Is it not an axiom that the only two classes of patients who receive the maximum advantages of modern medicine are the very rich—and the very poor? Naturally, children in hospital have their pessimistic moments, but judging by the racket they make in singing and playing, these moments are short and few for most and not greatly prolonged in even the unhappiest.

Such publicity is harmful. It has a colouring of truth but it is not true. To state the bald facts would not, of course, have made such a good story so the sob-sister who wrote it touched it up. To be sure many who read it have by now forgotten it, but there may remain in their minds a residuum of unpleasantness associated with charity wards and house doctors and inattention and needless surgery.

I suggest that we have a Public Relations Committee or something of the sort, a Committee of the C.M.A. with members in each Province of which the duty would be to scan the newspapers and insist upon accuracy of reporting. Letters to editors should also be considered and when these contain obviously false statements or distorted facts, steps should be taken to correct the errors. Publicity has become an important thing. If we wish the people to appreciate what we are striving to do for them, we must give them the facts. If we permit distorted sob stories and the like to go unchallenged, we weaken our own cause and give ammunition to the enemy. Our silence is interpreted as inability to deny. It is time, I think, that we checked such wild tales and, further, gave publicity to our own story of what our profession has done and is doing.





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IN ACUTE AND CHRONIC SINUSITIS**

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*For Use . . . . .*

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outstanding among vasoconstrictors... in a new solution—especially prepared and buffered for use with penicillin.

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containing one vial each of dried calcium penicillin and specially buffered Neo-Synephrine Hydrochloride Solution ¼%... to be mixed just prior to dispensing. When mixed, each cc. contains not less than 1000 units of penicillin at pH 6.0.

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<sup>1</sup>Ann. Otol. Rhin. & Laryng. 52:541, 1943.

<sup>\*</sup>Trade-mark Registered

## Association Page

### Manitoba Medical Association Annual Business Meeting

It is hoped that all members of the Manitoba Medical Association will attend the Annual Business meeting, which will be held on the afternoon of Tuesday, June 24th. Matters of concern to the profession in Manitoba will be discussed, while in the evening our Association will be hosts at a complimentary dinner to the Canadian Medical Association General Council and wives. The Chairman, Doctor Stuart Schultz, and his Committee are already preparing for this event and excellent entertainment is assured. If you are approached by the Committee DO assist.

### Nominating Committee of the Manitoba Medical Association

For several weeks the District Societies have been sending in the names of representatives to the Nominating Committee. As constituted the Committee is composed of:

- Dr. J. R. Martin, Chairman.
- Dr. W. S. Peters, Brandon, Brandon and District Medical Association.
- Dr. J. W. Kettlewell, Portage, Central Medical Society.
- Dr. A. S. Little, Dauphin, Northern District Medical Society.
- Dr. C. S. Crawford, The Pas, North of 53 District Medical Society.
- Dr. E. D. Hudson, Hamiota, Northwestern District Medical Society.
- Dr. E. K. Cunningham, Carman, Southern District Medical Society.
- Dr. M. B. Perrin, Winnipeg, Winnipeg Medical Society.

Seven of the above members met on Sunday, March 16th—one member sent word that it would be impossible for him to spare the four days which the trip would necessitate at this time. A slate of nominations was drawn up, and a committee chosen to interview the prospective candidates. An interesting election is anticipated.

### Canadian Medical Association Annual Meeting

Have you marked your calendar and made your reservations for the Annual Meeting of the Canadian Medical Association, which is being held at the Royal Alexandra Hotel, June 23rd to the 27th?

General Council, C.M.A., meets on Monday and Tuesday, June 23rd and 24th, and the Manitoba Division will be represented by the President, the Secretary or Joint Secretaries, and: Doctors A. Hollenberg, P. H. McNulty, W. S. Peters, R. W. Richardson, H. S. Evans, C. E. Corrigan, Elinor Black.

Dr. D. L. Scott has been named to represent the Manitoba Division on the Canadian Medical Association Nominating Committee.

### Senior Membership, Canadian Medical Association

Nomination for Senior Membership in the Canadian Medical Association may be made by the local division, but election is only by unanimous approval of the C.M.A. Executive Committee in session present and voting. Usually one member is chosen from each Division and two from the Division in which the Annual Meeting is held. The Canadian Medical Association this year will honour one rural and one urban member of the profession in Manitoba.

### We Require Your Correct Address

in order that we may promptly send you your receipts and membership card when you have remitted membership fees for the current year—for sending reminders to those who have overlooked payment of membership fees, especially if they are participating members of the Manitoba Medical Service, for sending notices to those who are entitled, by reason of service with the Armed Forces, to complimentary membership—for ensuring that paid-up and complimentary members receive the Canadian Medical Association Journal and the Manitoba Medical Review promptly, since there is no guarantee that back numbers will be available to members in arrears . . . in order that the membership list may be maintained up-to-date . . . in order that a former patient or one who may wish to make a remittance may be directed to your office . . . **we require your correct address!**

### Report of Meeting

At the March meeting of the Manitoba Division of the Canadian Anaesthetists' Society, Dr. I. MacLaren Thompson, professor of Anatomy, presented a most interesting and instructive paper entitled "The Anatomical Considerations of Spinal Anaesthesia." The embryology of the dermatomes sig-



nificant in spinal and regional anaesthesia was outlined and illustrated by means of lantern slides. Dr. Thompson also dealt with the modern concepts of dermatome distribution. During this discussion and question period which followed, several other anatomical considerations were discussed including the blood supply of the spinal cord.

Dr. D. G. Revell presented a short paper entitled "Practical Hints for the Busy Anaesthetist." He stressed the value of special equipment and apparatus. The paper was illustrated with various types of ingenious apparatus invented and constructed by the author.

The Annual Meeting of the Western Division of the Canadian Anaesthetists' Society was held March 13-15th at Edmonton. Attending from Winnipeg were the following Anaesthesiologists: Dr. D. C. Aikenhead, Dr. Hutchison, Dr. Letienne, Dr. P. C. Lund and Dr. D. G. Revell.

### North of 53 District Medical Association

A recent letter from Dr. J. M. Ridge tells of the reorganization meeting of the North of 53 District Medical Association which was held at St. Anthony's Hospital, The Pas, on December 9th, 1946, following dinner at the Coffee House. Officers for the year 1947 were elected as follows: President—Dr. A. E. McGregor, Sherridon.

Vice-President—Dr. Percy Johnson, Flin Flon.

Secretary—Dr. J. M. Ridge, The Pas. ("Because he 'gets around' and has a stenographer.")

Representative to Executive M.M.A.—Dr. C. S. Crawford, The Pas.

Plans were made to hold three or four meetings during the winter months and special meetings as warranted by the presence, during the hunting or fishing seasons, of prominent visiting doctors. (Dr. J. R. Martin, the M.M.A. President, recently returned with honours from the St. Paul Bonspiel, wonders why curling was excluded). Following the meeting an informal get-together was held at the home of Doctor M. K. Brandt.

Congratulations are extended to this northern group. The Executive will co-operate in the matter of arranging speakers, as for other district societies, from the grant for Extra-Mural purposes which is made available annually by the College of Physicians and Surgeons.

### The Association Welcomes the New Section of Neurology and Psychiatry

A meeting of psychiatrists was held on February 5th, 1947, at Selkirk Mental Hospital for the purpose of organizing a Psychiatric Section of the Manitoba Medical Association. The follow-

ing slate of officers was elected for the year Chairman—Dr. G. L. Adamson.

Vice-Chairman—Dr. H. Atkinson.

Secretary—Dr. G. A. Little.

Treasurer—Doctor M. E. Bristow.

Executive Members—Doctors A. T. Mathers,

Pincock and L. P. Gendreau.

The aims and objectives of the Section

1. Those of the Manitoba Medical Association, plus,

2. The fostering of scientific meetings will serve to inform the whole section of advances in psychiatry in Manitoba and elsewhere.

3. To provide to closer liaison between psychiatrists in Government employment those in private practice.

The membership shall be composed of:

1. Ordinary members; 2. Associate members; 3. Honorary members; 4. Members by invitation.

The Association congratulates the new Section.

### Professional Registry

Following the February meeting of the Executive, the President consulted with the President of the College of Physicians and Surgeons named Doctors C. B. Stewart and D. L. Stewart as a committee with the Executive Secretary to consider applications and answer correspondence. Requests are being received in increasing numbers from Doctors seeking locations. Last week there has been a request for a Locum Tenens from the middle of May, and one from a hospital for a Houseman. Interested parties should contact the M.M.A. Executive Secretary.

### American College of Surgeons

As notified elsewhere in this issue, the time and place and date for the Sectional Meeting of the American College of Surgeons will be at the Royal Alexandra Hotel, April 28th and 29th.

### Narcotics

Attention is drawn to Section 5, Page 6 of the Opium and Narcotic Drug Act, 1929, which states: "... any retail druggist who gives, sells or furnishes any drug to any person, except on a written order or prescription signed and countersigned by a physician ... whose signature is known to the said druggist or if unknown duly verified by such order or prescription is filled, or who gives any prescription to sell any drug on more than one occasion, shall be guilty of an offence."

By signing a prescription in full and in the name of the physician you will protect the druggist from possible loss. The suggestion is also made by the R.C.M.S. that instrument bags which might contain drugs should not be left in an unlocked trunk. The locked trunk might be safer!

## Personal Notes and Social News

Reported by K. Borthwick-Leslie

Dr. Ellen Douglass entertained the Medical Women of Winnipeg at dinner last week at the Professional and Business Women's Club. The guests of honor were Dr. Jessie Findlay, of Valloire, India, and Dr. Elizabeth Thurrott, of Jhansi, India. After dinner a reorganization meeting was held of the Manitoba Branch of the Federated Council of Medical Women of Canada. The new slate of officers is: President, Dr. Ellen Taylor; Secretary, Dr. K. Borthwick-Leslie; Treasurer, Dr. Sybil Kobrinsky.

The marriage of Miss Hilda Carlson, of the Children's Hospital staff to Dr. Gerald Galloway, took place the 28th of March at Wynyard, Sask. Dr. and Mrs. Galloway will reside in Selkirk, Man.

The marriage of Dr. Christina Curran, formerly Captain in the R.C.A.M.C., to Mr. Frank Woodsworth, took place in Ottawa in March. After their wedding trip to New York, Mr. and Mrs. Woodsworth will reside in Ottawa.

Mrs. Helen Wildman and Ida Armstrong are enjoying a golfing, motor holiday in Mexico and Texas. Rumors fly that golfers are even more interesting than golf.

Among the numerous lucky holidayers are Dr. and Mrs. A. M. Davidson, Vancouver and Victoria; Dr. and Mrs. Harold Popham, Victoria, B.C.; Dr. and Mrs. M. R. MacCharles, accompanied by Dr. and Mrs. 'Scotty' McQueen, in the Eastern States and Bermuda.

Dr. and Mrs. Walter Leslie, Halifax, are being congratulated on the birth of twins, a boy and girl, on the 20th of February, 1947.

Dr. H. B. M. Hunter, only son of Dr. and Mrs. H. A. Hunter, of Reston, Man., was married to Vera Bernice, younger daughter of Mr. and Mrs. J. N. Benedict, Minnedosa, Man., on February 26th.

Dr. Donald Ralph Collins, elder son of Dr. and Mrs. Ralph Collins, of New Westminster, B.C., was married on March 1st to Iva May, only daughter of Mr. and Mrs. Robert Marner, of Stonewall, Man.

Dr. George M. Black, son of Mr. and Mrs. J. M. Black of Strathclair, Man., was married on March 5th to Beatrice Alexandra, daughter of Mr. and Mrs. J. A. Shaw. Following a honeymoon to Minneapolis, Dr. and Mrs. Black will reside in Sherridon, Man.

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recent research indicates

**R**EASONS for the laxative properties of bran have long been debated. Some have held that the laxative effect of bran is due to mechanical action. Evidence now indicates that this action is biological, rather than mechanical.

Recent studies conducted by Reynier (1) now shed more light on the reason for bran's action.

Reynier succeeded in rearing axenic, or germ-free animals—animals lacking intestinal flora. They were born through Caesarian section, and continuously maintained in aseptic environment. From different types of feeding, research workers were able to make the following observations:

1. Animals in a non-axenic (natural) state usually obtain a definite laxative effect from bran.
2. Axenic (germ-free) animals become constipated when sterile bran is included in their diets.
3. When axenic animals are inoculated with certain multiple flora, bran then exerts its characteristic laxative effect.

The investigators concluded that the laxative effect of bran is not due to mechanical action on the intestinal mucosa, since it failed to act in axenic animals.

The investigators also concluded that the laxative effect of bran is due to a biological reaction in the intestinal tract, and that this effect is imparted to the bran by symbiotic intestinal flora which feed upon it.

As shown in earlier research, these beneficial microorganisms evidently produce gases occluded in the colonic content and thus help to fluff up the mass and prepare it for easy elimination.

Kellogg's, makers of Kellogg's ALL-BRAN, will be pleased to send you reprints of the articles from which this report has been summarized. Use coupon below.

(1) Reynier, J. A., *GERM-FREE LIFE APPLIED TO NUTRITION STUDIES*. Laboratory of Bacteriology, University of Notre Dame.

### PLEASE SEND:

1. Germ-free Life Applied to Nutrition Studies ☐
2. Mode of Action of ALL-BRAN in Laxation ☐
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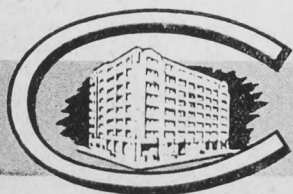
**ADULTS:** Treatment is started with 1 tablet four times daily, preferably after meals. If symptoms are controlled, the dosage is reduced to 1 tablet twice daily or  $\frac{1}{2}$  tablet four times daily.

**CHILDREN:** In young children dosage is determined on a basis of relative weight. In older children satisfactory response is usually obtained with approximately one-half the adult dose.

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## Department of Health and Public Welfare

### Comparisons Communicable Diseases — Manitoba (Whites and Indians)

DISEASES	1947		1946		TOTALS	
	Jan. 26 to Feb. 22, '47	Dec. 30, '46 to Jan. 25, '47	Jan. 27 to Feb. 23, '46	Dec. 30, '45 to Jan. 26, '46	Jan. 1 to Feb. 22, '47	Jan. 1, to Feb. 23, '46
Anterior Poliomyelitis	0	0	1	0	0	1
Chickenpox	77	130	136	168	207	303
Diphtheria	10	12	17	19	22	36
Diphtheria Carriers	2	3	3	1	5	4
Dysentery—Amoebic	0	0	0	1	0	1
Dysentery—Bacillary	1	0	0	1	1	1
Erysipelas	6	5	16	7	11	23
Encephalitis	0	0	0	0	0	0
Influenza	12	4	43	23	16	66
Measles	1030	621	13	39	1651	52
Measles—German	4	0	1	1	4	2
Meningococcal Meningitis	3	1	0	2	4	2
Mumps	200	152	150	122	352	272
Ophthalmia Neonatorum	0	0	0	0	0	0
Pneumonia—Lobar	28	13	22	18	41	40
Quarrel Fever	0	0	1	0	0	1
Scarlet Fever	25	25	52	60	50	112
Septic Sore Throat	2	1	4	4	3	8
Smallpox	0	0	0	0	0	0
Tetanus	0	0	0	0	0	0
Trachoma	0	0	0	0	0	0
Tuberculosis	38	17	46	37	55	83
Typhoid Fever	0	0	2	0	0	2
Typhoid Paratyphoid	3	0	0	0	3	0
Typhoid Carriers	1	0	0	0	1	0
Undulant Fever	1	0	0	3	1	3
Whooping Cough	81	52	18	32	133	50
Gonorrhoea	151	181	184	188	332	372
Syphilis	64	31	58	58	95	116
Diarrhoea and Enteritis, under 1 yr.	12	5	12	10	17	22

Four-Week Period Report, January 26 to February 22, 1947

DISEASES (White Cases Only)	*718,699 Manitoba	*3,825,000 Ontario	*906,000 Saskatchewan	*2,972,000 Minnesota
Approximate population.				
Anterior Poliomyelitis	4			6
Chickenpox	77	1374	121	
Diarrhoea & Enteritis (under 1 yr.)	12			
Diphtheria	10	21	3	29
Diphtheria Carriers	2			
Dysentery—Amoebic		14		7
Dysentery—Bacillary	1			
Erysipelas	6	3	1	
Influenza	12	47		
Measles, Infectious		46		
Malaria		1		
Measles	1030	275	429	259
Measles—German	4	188	6	
Mumps	200	2020	781	
Pneumonia, Lobar	28			
Scarlet Fever	25	348	6	133
Septic Sore Throat	2	15		
Tuberculosis	38	99	57	9
Typhoid Fever		5		
Typhoid Fever Carriers	1			
Para-Typhoid Fever	3	1		
Undulant Fever	1	7		12
Whooping Cough	81	357	27	47
Gonorrhoea	151	397		
Syphilis	64	315		

#### DEATHS FROM COMMUNICABLE DISEASES

For 3-Week Period January 7 to January 28, 1947

**Urban**—Cancer, 31; Diphtheria, 1; Pneumonia, Lobar, 4; Pneumonia (other forms), 8; Tuberculosis, 4; Whooping Cough, 1; Hodgkin's Disease, 1; Septic Sore Throat, 1; Diarrhoea and Enteritis (under 2 years), 1; Disease of Skin, 1. Other deaths under 1 year, 13. Other deaths over 1 year, 122. Stillbirths, 6. Total, 141.

**Rural**—Cancer, 8; Diphtheria, 1; Influenza, 1; Pneumonia, Lobar, 3; Pneumonia, 7; Tuberculosis, 5; Disease of Pharynx and Tonsils, 1; Diarrhoea and Enteritis (under 2 years), 1. Other deaths under 1 year, 5. Other deaths over 1 year, 58. Stillbirths, 7. Total, 70.

**Indians**—Pneumonia, Lobar, 2; Pneumonia (other forms), 1. Other deaths under 1 year, 1. Other deaths over 1 year, 1. Stillbirths, nil. Total, 2.

**Anterior Poliomyelitis** — Ontario reports four cases and Minnesota six. These are occurring early in the year as regards seasonal incidence for this disease.

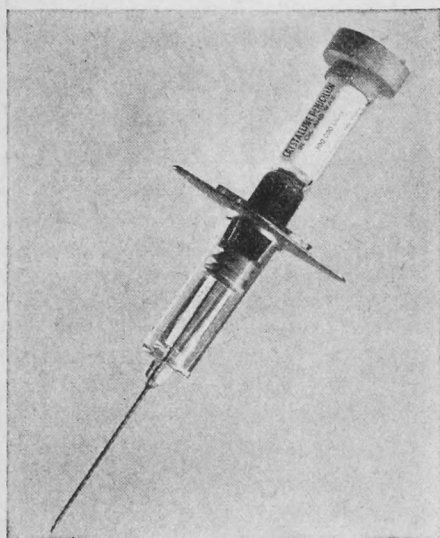
**Measles** is definitely epidemic in Manitoba!

**Mumps** is epidemic in Ontario and Saskatchewan.

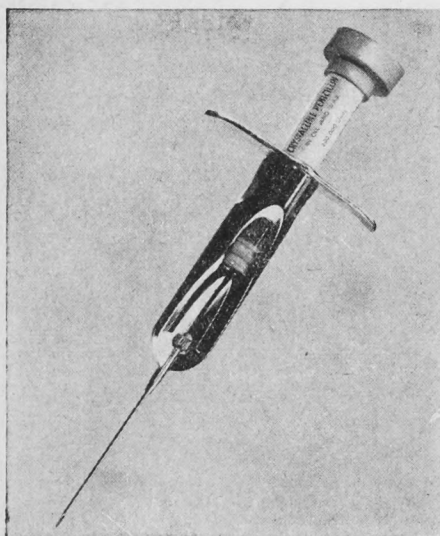
**Gonorrhoea and Syphilis** both show a slight decrease to date this year.

By the time this issue of the Review reaches you it will again be time to plan immunization clinics for this year. Just let us know what you need.

## CRYSTALLINE PENICILLIN IN OIL AND WAX (ROMANSKY FORMULA)



Disposable Plastic Syringe



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### A FURTHER ADVANCE

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**Ease of Administration**—The improved product flows more freely through a hypodermic needle.

**Minimum of Local Reaction**—Because of the high purity of the crystalline penicillin in the mixture, local reactions are reduced to a minimum.

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#### DISPOSABLE PLASTIC SYRINGE PACKAGE

Included in this package is a sterile B-D\* Disposable Plastic Syringe, ready for immediate use with a special cartridge containing 300,000 International Units of crystalline penicillin in 1 cc. of peanut oil and beeswax. The plastic syringe is discarded after use.

#### METAL CARTRIDGE SYRINGE PACKAGE

This package includes a B-D\* Metal Cartridge Syringe, two 20-gauge needles, and a cartridge containing 300,000 International Units of crystalline penicillin in 1 cc. of peanut oil and beeswax. The metal syringe is designed for repeated use with readily changeable needles and cartridges.

#### REPLACEMENT CARTRIDGE PACKAGE

Replacement cartridges containing 300,000 International Units of crystalline penicillin in 1 cc. of peanut oil and beeswax are obtained separately from the Laboratories. These cartridges are supplied for use with the metal cartridge syringe.

\*T.M. Reg. Becton, Dickinson & Co.

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## Department of Health and Public Welfare

### Trends in the Care of the Chronically Ill or Long-Term Patient\*

R. P. Vivian, M.D., Montreal, Quebec

Strathcona Professor of Health and Social Medicine, McGill Univ. Faculty of Med.

One of a series of reports on the care of the chronically ill patient which appeared in the Bulletin of the American College of Surgeons, September, 1946, issue.

The chronically ill and incurable patient is a major problem. The increasing number of families living in apartments or under crowded conditions, the almost complete lack of domestic help, and the deficiencies in visiting-nurse service have all created greater need for institutional care. Lack of suitable accommodation elsewhere has resulted in a large number of these patients being cared for in public general hospitals. The serious effect of this is that the general hospitals are now obliged to delay service to the more acutely ill and to strain all their resources in carrying this additional load.

The results are clearly shown in a recent survey (December, 1945), of 7 hospitals in Montreal. The total bed accommodation of these hospitals is 2,449. Total admissions in one year (1944) were 47,946, giving an average stay per patient of 13.9 days. Patients could be discharged after a maximum stay of 60 days, 37,256 days' care would be saved, releasing 102 beds and permitting admission of 874 more patients.

If the chronically ill patient is to be discharged from active treatment at the end of 60 days, some other type of care must be provided. A number of patients will require some continuation of treatment which should be given in close association with a public general hospital. Many could be discharged to institutions providing nursing care and medical supervision if these institutions existed in greater numbers. Some could be well cared for in suitable boarding homes or even in their own homes if other facilities for service could also be made available.

This group of patients represents, however, only one portion of those classified as chronically ill. Another group is found in the overcrowded mental institutions. Attention needs to be given to the care of arteriosclerotic and senile dementia patients on some other basis than now in vogue. Psychiatric service could be greatly improved if such recognition were translated into action.

Solution of the problem would seem to lie in providing a limited number of beds for the long-stay patient in special accommodation within a public general hospital. This should be separated

from the general activities and expense of the hospital which provides facilities for treatment of the more acutely ill. The effect should be to free the major portion of the costs of ancillary services from the per diem rate creating lower-priced accommodation than can at present be made available in the public general hospitals. It is imperative that additional institutions be established to provide nursing care and medical supervision. These could be constructed at considerably less cost than public general hospitals. It is difficult to attract voluntary funds for construction of institutions for the chronically ill. A substantial portion of the cost of construction will need to be obtained out of tax-collected funds from appropriate levels of government. In my opinion, the management should be left to a voluntary group so that the hospital may have the benefit of organizations such as women's auxiliaries, which contribute a great deal in added comforts for patients and stimulate a good type of management.

In smaller communities or in certain portions of larger ones, supervised boarding homes could be of great help. Experience with boarding homes in the past has frequently been unfortunate because of inadequate supervision, absence of suitable medical control, and difficulty of obtaining enough money for maintenance. The problem of maintenance is also a very real one either in the public general hospital or in an institution providing care for the chronically ill. The length of stay and the economic status of the majority of patients mean that they cannot finance themselves, and the strain is usually too heavy to be continued for very long by their families.

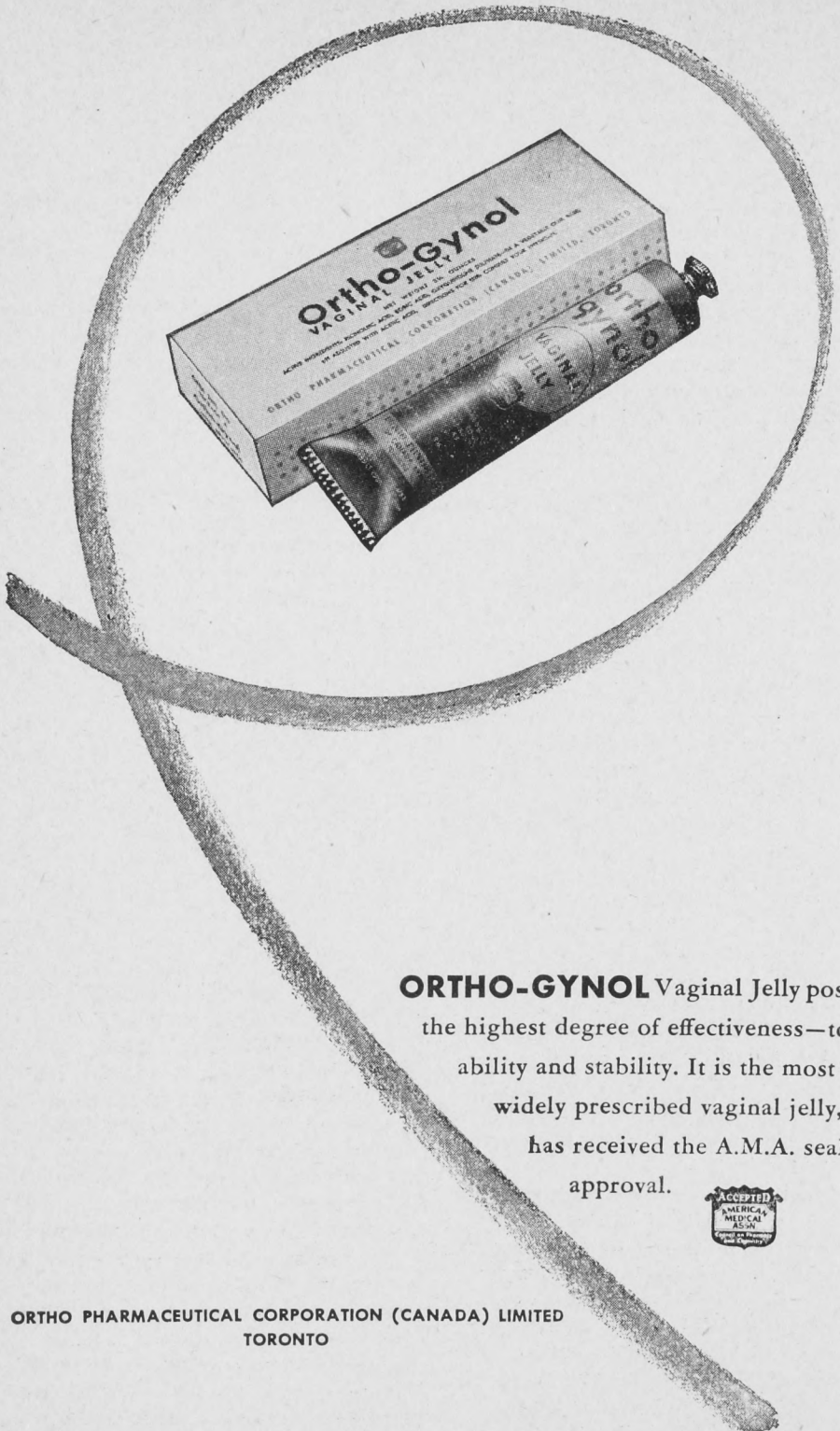
Care in the home might be achieved in many more cases if a tax-supported visiting-nurse service and some domestic assistance were made available.

Adequate care for the chronically ill and incurable patient will remain a problem until such time as governments are prepared to pay the full per diem cost of care. In this, the taxpayer must be protected through uniform cost accounting systems under government supervision.

The answer to the problem of care for the chronically ill and incurable patient does not lie merely in the treatment, such as it is, of existing cases. We must take into account the ways and means of achieving a better method by which more of these cases can be prevented through the establishment of a comprehensive program in public health and social welfare.

\*Presented at the Sectional Meeting of the American College of Surgeons, Montreal, Quebec, March 23, 1946.





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## A Pioneer Woman Doctor of Western Canada

M. Ellen Douglass, M.D., C.M., Commander (Sister) of the Order of St. John

Dr. Charlotte Ross was born in Yorkshire, England, and at the age of five years came to Canada with her parents, Mr. and Mrs. Joseph Whitehead, who settled at Clinton, Ontario.

Her early education was received at a convent in Quebec and she became so proficient in the study of languages that she later won a prize in French at the Sacred Heart Convent in Montreal.

At the age of 18 she married a Scotsman, David Ross, and seems to have been as happy in her choice of a husband as that of a career, for the oldsters in Manitoba are loud in their praise of Dr. David Ross.

It was not until after her fourth child was born that Dr. Ross decided to study medicine. Having an invalid sister, and trying to find some way to lessen her suffering, had started Dr. Ross thinking, reading up, and studying various remedies. When the family physician told Mr. Ross that his wife "knew as much as half the doctors," he decided if she knew a little, it would be a good thing to know more, so she straightway went to the doctor and discussed the matter, with the result that he loaned her books to read.

Finding her an apt pupil, the doctor strongly advised her to study medicine and went so far as to write to the Women's Medical College, Philadelphia, for a prospectus, as there was no medical college in Canada open to women at that time, and he finally made all the necessary arrangements for her to enter that institution as a student.

Dr. Ross was a devoted wife and mother and most solicitous of the welfare of her family, but her husband being a railroad contractor was away from home a great deal, so it was as convenient for her to live in one place as in another. When she was ready to begin her medical studies she decided to leave the oldest child, who had now reached school age, with the grandparents in Montreal, and take the other three, and a niece to help care for them, to Philadelphia with her.

You may be sure that Dr. Ross' plan met with a good deal of opposition. Even her father, a member of parliament and a successful railroad contractor was not quite advanced enough in 1865, to believe in medicine as a career for a woman, particularly a married woman. However, Dr. Ross was not to be dissuaded and in carrying out her plans displayed great courage and willpower—these attributes she no doubt inherited from her father himself, for as a young lad he had fired the first steam engine invented by Stevenson, "The Rocket," which is now enthroned in state at Burlington, England. In later years, Dr. Ross had the satisfaction of having her father tell her that he was very proud of her.

Instead of taking four years as was customary at that time, Dr. Ross spent ten years in completing her course, not because she lacked ability, but because more children were born and Dr. Ross gave them all the attention she considered a true mother should, waiting until they were of an age when she could go on with her studies without interfering with their proper development.

She graduated in 1875 and opened an office in Montreal where her husband was engaged in business. She was the first woman physician in Montreal and soon had a very good practice, which she gave up in 1878 to join her husband and father who were building section 15 of the Canadian Pacific Railway, with headquarters at Whitemouth, Manitoba.

The next 35 years were so full of interest that I feel myself highly honored to have had the opportunity to listen to Dr. Ross herself recount some of her experiences.

Hundreds of men were working in the lumber camps around Whitemouth and many serious accidents occurred. As there was not another doctor within 60 miles, Dr. Ross had to treat the injured. Once a tree fell on a young lad, fracturing his spine. The doctor's efforts were of no avail and she not only had to comfort the dying boy, but it fell to her lot to break the tragic news to his mother.

Dr. Ross told me about sewing up wounds with an ordinary needle and thread, using a sterilized thimble in lieu of a needle-holder. Adaptability was developed in her to the nth degree.

In 1930, while conducting a Health Conference at Boissevain, I received unsolicited testimony of Dr. Ross', unselfish devotion to her work. One of the babies brought to me for examination had on its chart—"birthplace, Whitemouth," so I asked the mother if she had known Dr. Charlotte Ross. "Did I know Dr. Ross?" she replied, "I should say so. She was the greatest woman in the world. She looked after my mother when all her nine children were born. At one birth, she left her own little five-year-old boy dying, knowing there was nothing more she could do for him, and walked one and a half miles through snow and slush up to her knees to help my mother." The woman went on to say: "Another time, mother and seven of the children had measles, and Dr. Ross not only treated the measles, but she baked all the bread for father and the rest of us."

Dr. Ross had a wonderful sense of humor, but it must have been tried beyond endurance one night, when a man called to say that his daughter was dying, and asked the doctor to go back in the sleigh with him as quickly as possible. Just as they were starting, the roof of the Ross house

caught fire. The doctor and her husband succeeded in putting out the fire while the man stood impatiently waiting, never offering to lend a hand. It was 40 below zero and several times during the ten-mile drive Dr. Ross had to get out and run behind the sleigh to keep from freezing. On arriving at the patient's home, imagine her surprise to find the "dying girl" sitting up in bed chewing gum, while her lover sat beside the bed keeping vigil. She had only had a fit of temper and hysterics.

During the early days conditions were very primitive and Dr. Ross carried food, clothing and even boiled water to many of the patients' homes, riding on hand cars, engines, box cars, rough wagons or sleighs. Accidents were an everyday occurrence, and Dr. Ross became so accustomed to them, that she was heard one day discussing a cake recipe with the women at the station house, while scrubbing up after amputating a man's leg, which had been crushed by a train.

When the British Medical Association met in Winnipeg in August, 1930, one of the most interesting ceremonies was a memorial service to Dr. Charlotte Ross. It was a real sunrise service for the sun came out at 7.30 a.m. August 28th, just as we gathered by the grave in Brookside cemetery. Doctors from overseas and Canada joined in doing honor to the memory of the pioneer woman doctor of Western Canada. Dr. Mary Crawford, at that time president of the Canadian Federation of Medical Women conducted the service of prayer and Dr. Edith Ross, a granddaughter of Dr. Charlotte Ross placed a wreath on the grave.

Her granddaughter was a worthy successor and specialized in the field of anaesthetics, holding the position of chief anaesthetist in St. Boniface Hospital for some years prior to her death which occurred in 1932, after an illness of some months, borne with such patience and fortitude that her friends were wont to say that a visit to Edith's room was like a pilgrimage to a shrine.

America's famous surgeon, Dr. Charles Mayo, head of the well-known clinic that bears his name at Rochester, Minnesota, in speaking at the British Medical Association convention in Winnipeg, said that religion was a human and vital factor in the successful practice of medicine. This truth was exemplified in the life of Dr. Charlotte Ross, for she carried religion into her daily life and made all the difference in the world in that frontier town of Whitemouth. She kept a church and Sunday School going and her husband built a Protestant church, a Roman Catholic church and a

school. Their home life was ideal and the atmosphere in it spread to the surrounding so that crime became unknown.

It was at a reception in the home of Dr. Todd, Winnipeg, that I first met Dr. Charlotte Ross and followed her about like one enamored as I really was. I shall quote from a short story written by Dr. Todd on Manitoba's Pioneer Woman for the Manitoba Medical Review, January, 1928:

"Compressed into one human compass were the mother, friend and physician, with stored energy adequate to vitalize each to its fullest function. If, as some say, the physician is of the ships that are passing, let us bow our heads in respect to a noble and sacrificing physician who held it her highest honor that she was a general practitioner; and it is true that only pioneer conditions can produce such characters, then has civilization lost something it may well regret."

Dr. Ross was very fond of music and as a child was taught by Madame Albani's father. Her hobby was the collecting of china, and some of my highly prized possessions are a few pieces from a 24-person dinner set of hers given to me by my granddaughter, Dr. Edith Ross. So precious were they that only once a year at my family party on New Year's Day the sauce dish is used and she fails to draw from my guests remarks of neglect.

Dr. Charlotte Ross died in 1916, having retired from active practice three years previously. Her life and service are the great undertone of the harmony of life, and in reviewing Dr. Ross's life one might feel that she had been inspired by Whittier's poem, "The Healer."

The paths of pain are thine, go forth  
With patience, trust and hope;  
The sufferings of a sin-sick earth  
Shall give thee ample scope.  
Beside the unveiled mysteries  
Of life and death, go stand  
With guarded lips and reverent eyes  
And pure of heart and hand.  
So shalt thou be with power endure  
From Him who went about  
The Syrian hillsides doing good,  
And casting demons out.  
That good Physician liveth yet,  
Thy friend and guide to be;  
The Healer by Gennesaret  
Shall walk thy rounds with thee.

For there isn't any doubt the Healer Gennesaret did walk her rounds with her.



## Manitoba Medical Service

The scale of fees authorized by the Manitoba Medical Association came into operation on February 1st. It will save time for everyone if in writing in your report you will use the same terms as those in the booklet. The Medical Director is familiar with all the services rendered in modern surgery, etc., and frequently has to call you or search the hospital records, and then try to decide which of several operations it fits. "Tumor" is frequently used, but no evidence as to whether it is benign or malignant is given, though all that is necessary is to put a ring around the figure. "Laboratory" and "Gastric Analysis" frequently have a fee but no information. In "Extractions, kindly state if with mydriatic, also E.K.G.'s please advise if with interpretation. Please remember that you have asked for a reduction in administration, and these and many other things add to the costs.

In the case of immunization for children, where there is an overall fee, send in your bill when the service is completed; subscribers drop out of the plan from time to time, and service might be given to a family who are no longer members. There are going to be many unforeseen problems in connection with the new fee scale; if you will watch this page you will find out from time to time how they are to be solved. A common one is the patient who demands service which the attending physician thinks unnecessary, and yet does not want to offend a patient by refusing. Tell the patient that as you do not think Manitoba Medical Service will pay for it, they will have to get written consent at our office; it will help a great deal if you would warn us by telephone; you may be assured that your name will not be used, as nobody on the staff except myself can give the authority. Some of you will have noted that patients of yours have been reverted to the "Plan"; it should have been instituted earlier, if we had not the staff. Individuals who cost \$5.00 to \$150.00 a year or families costing from \$50.00 to \$400.00, not including major surgery, accidents or confinements, but including numerous office and home visits, are written to, and invited to come in and see the picture which the case record shows. Many of them say, "the doctor told me to come back" or "the doctor looked in when I was passing the house." Well we have nothing to do with that, but the patient is told that Manitoba Medical Service cannot and never was intended to provide such a service.

Now it is time to consider the future. Manitoba Medical Service is going to be thoroughly re-organized. More office space is urgent, and negotiations are being carried on. Two small

offices which should at the most house a staff of four, have ten, besides filing cabinets, several typewriters, etc. Much filing has to be done on the floor, where there is any floor. A staff of at least fifty per cent greater is needed.

You may ask how work is being done. Well, it is kept going by overtime and night work on the part of a very loyal staff. Please do not include me in that category. I frequently do some work over the week-ends at home, but after forty-five years of practice, I am quite unable to keep up with the younger people when it comes to long hours. Gentlemen, we have had no resignations from our staff; you will have to ask Mr. Richardson the reason, but don't imagine that they have an easy time, or receive high salaries. They have neither, and not much comfort in their working conditions.

One of the lay members of the Board, Mr. Gordon Lawson, is doing very valuable work in the re-organization of our administration, and is devoting much time to the solution of our problems. For example when he was in Toronto recently, he spent several hours in the offices of Associated Medical Services, studying their administrative and statistical methods. Dr. Hannah, the Medical Director, very generously offered to send one of the senior members of his staff to assist us in setting up an efficient office. I mention these things because I think you know as well as I do that administration is not included in the medical curriculum. All enrolment has been discontinued, with the exception of those groups which have been interviewed by the enrolment department and have been given folders describing the plans, as well as application cards. Re-opening of enrolment is not likely to take place before three to four months, and may be longer. During the interval we shall try to catch up with the back log; for instance we are only just finishing the reports of work done by doctors in January, most of which reached us in the first ten days of February. (This is being written on March 18th).

You will be told more of our plans in the next issue.

E. S. Moorhead.

Dr. S. A. Boyd, recently demobilized from the R.C.A.M.C., after seven years service, three and a half years overseas; has re-entered civilian practice at 521 Medical Arts Building. Phone 95 921. Practice is limited to Diseases of Children.

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\*P. C. Roberts: W. Jnl. Surg., Obs. & Gyn. **52**, 380, 1944  
D. G. Tollefson: *Ibid* . . . . . **52**, 383, 1944  
A. C. Kirchhof et al: *Ibid* . . . . . **52**, 197, 1944  
E. P. Farber: Am. J. Obs. & Gyn. . . . . **51**, 859, 1946



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## American College of Surgeons

### Sectional Meeting in Winnipeg, April 28-29

The last of a series of seven Sectional Meetings of the American College of Surgeons will be held in Winnipeg on April 28 and 29, with headquarters at the Royal Alexandra Hotel, according to an announcement by Dr. Irvin Abell, of Louisville, President and Chairman of the Board of Directors. Manitoba and surrounding states and provinces will participate. The preceding six Sectional Meetings will be held in Baltimore, March 1-11; Omaha, March 14-15; Fort Worth, March 16-17; Providence, March 28-29; San Francisco, April 7-8, and Vancouver, April 21-22.

The medical profession at large, medical students, and hospital personnel, are invited to join the Fellows of the College in the meetings which will be addressed by nationally prominent and local speakers.

Leading the Committee on Local Arrangements for the Winnipeg meeting is Dr. Gordon S. Fahrni. The Sectional Meeting will open at 8.30 both mornings with the showing of medical motion pictures. On the first morning these will be followed at 10.00 o'clock by a scientific session for the medical profession on "Carcinoma of the Stomach," "Advances in Anesthesia," "Surgery of the Kidney," and "Surgery of the Thyroid in Relation to the Use of Thiouracil." At the same hour hospital personnel will open a symposium on five or postwar hospital problems.

Luncheons will be held on both days followed by round table conferences on subjects presented during the preceding morning sessions. The panel discussions for medical personnel on the first afternoon will be on "Intestinal Obstruction and its Complications." At a concurrent meeting, hospital personnel will discuss the management of emergency patients. On the first evening a dinner for fellows, other members of the medical profession, and hospital representatives will be held, following which there will be talks on activities of the College, a premiere showing of a medical motion picture now under production, and a reception.

On the second morning, following the showing of medical motion pictures, the medical program will be devoted to discussion of "The Use of Antibiotics in Surgical Practice," "Surgery of Malignant Growths of the Neck," and "The Prevention of Pulmonary Embolism." The hospital personnel will hold a symposium on "Basic Considerations in an Efficient Personnel Management Program." Panel discussions on "Postoperative Care" and "Carcinoma of the Colon" will feature the afternoon medical program, while the hospital personnel will hold a round table conference on questions arising out of the three previous sessions. Other problems not included in the program.

## Doctor Wanted

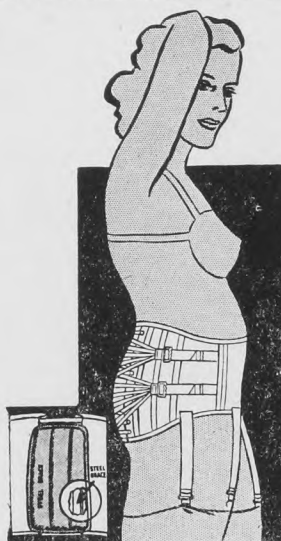
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## Medical Happenings for April

### Wednesday, 2—

Luncheon, Misericordia Hospital, 12:30 p.m.

### Thursday, 3—

Tumor Clinic, Winnipeg General Hospital, 9:00 a.m.

### Tuesday, 8—

Luncheon, Winnipeg General Hospital, 12:30 p.m.

### Wednesday, 9—

Tumor Clinic, Winnipeg General Hospital, 9:00 a.m.

### Thursday, 10—

Ward Rounds, Children's Hospital, 11:00 a.m.

### Thursday, 10—

Luncheon, St. Boniface Hospital, 12:30 p.m.

### Friday, 11—

Tumor Clinic, St. Boniface Hospital, 10:00 a.m.

### Friday, 11—

Luncheon, Victoria Hospital, 12:30 p.m.

### Tuesday, 15—

Luncheon, Grace Hospital, 12.30 p.m.

### Wednesday, 16—

Tumor Clinic, Winnipeg General Hospital, 9:00 a.m.

### Thursday, 17—

Ward Rounds, Children's Hospital, 11:00 a.m.

### Thursday, 17—

Luncheon, Winnipeg General Hospital, 12:30 p.m.

### Friday, 18—

Tumor Clinic, St. Boniface Hospital, 10:00 a.m.

### Friday, 18—

Meeting, Winnipeg Medical Society, 8:00 p.m., Medical College.

### Tuesday, 22—

Luncheon, St. Joseph's Hospital, 12:30 p.m.

### Wednesday, 23—

Tumor Clinic, Winnipeg General Hospital, 9:00 a.m.

### Thursday, 24—

Ward Rounds, Children's Hospital, 11:00 a.m.

### Thursday, 24—

Luncheon, St. Boniface Hospital, 12:30 p.m.

### Friday, 25—

Tumor Clinic, St. Boniface Hospital, 10:00 a.m.



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